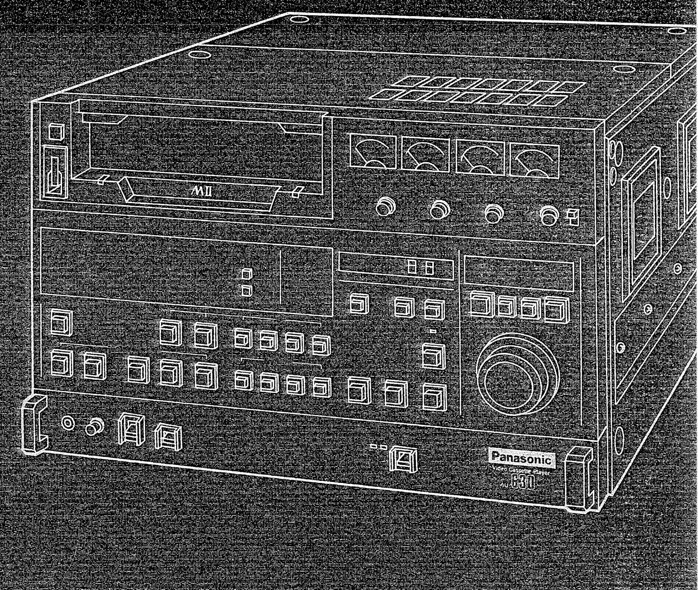
Panasonic

MII

STUDIO VTR

AU-630

Service Manual



MII Broadcast Systems

VQS0153

Service Manual

Maintenance Procedure
Mechanical Adjustment

(B)

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AU-650B/640/630 REGULAR MAINTENANCE

REGULAR MAINTENANCE

The purpose of periodic maintenance is to preserve the functioning of this machine throughout its useful life. The user or service dealer should perform these maintenance procedure regularly to ensure that maximum utility is obtained from the machine.

REGULAR MAINTENANCE IS NECESSARY

The MII-VTR is a complicated piece of equipment. It contains many belts, rollers, heads etc., which become worn, and deteriorate as time goes by, causing trouble. Dust and dirt will also impede the proper functioning of the machine. In light of this, it is very important that overall maintenance be done according to the maintenance chart to maintain the functions of the MII-VTR, and to avoid accidental problems. This maintenance should also be performed after any repairs are done on the equipment.

REGULAR MAINTENANCE IS RECOMMENDED

The MII-VTR used for broadcast applications requires particular attention for several reasons. The installation conditions and applications are not always the best. Long use times, or poor environmental conditions may adversely affect the lifespan and performance of the machine. Regular maintenance assures that the purchaser obtains the maximum value for this expenditure.
The specified fixtures and tools must be used to conduct adjustment requiring a fixture. The following fixtures and tools a required to conduct complete Mechanical Adjustments..

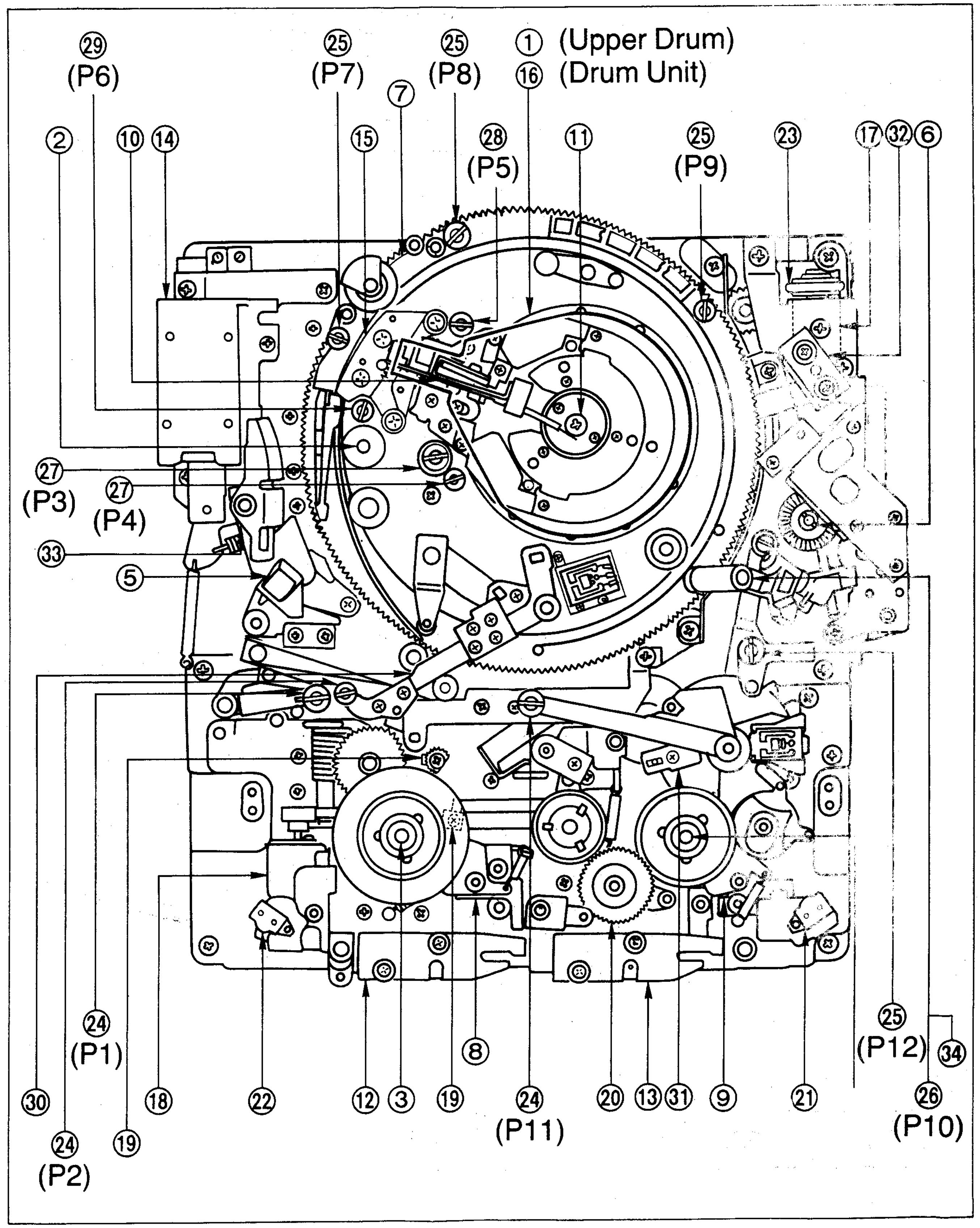
MAINTENANCE CHART

◎ for M.A.R.C (CART) ● Replacement

Part Name		Part No.	Pcs/Unit	Location No.	Using Hours 500	1000	1500	2000	2500	3000	3500	4000
Upper Drum (AU-650B)		VEH0383	1	1	●	●	●		●	●	●	
Upper Drum (AU-640)		VEH0446	1	1	●	●	●		●	●	●	
Upper Drum (AU-630)		VEH0448	1	1	●	●	●		●	●	●	
Capstan Unit		VEM0227	1	2				●				●
Supply Reel Motor		VRD0031	1	3				●				●
Take up Reel Motor		VRD0032	1	4				●				●
Full Erase Head (AU-650B/640)		VBS0040	1	5				●				●
Full Erase Head (AU-630)		VBS0043	1	5				●				●
TR Encoder Unit		*VXP0656	1	6				●				●
TR Bearing		VDB0778	2	6				●				●
Pinch Roller Arm Unit		VXL1288	1	7		●		●		●		●
Supply Main Brake Unit		VXL1280	1	8				●				●
Take up Main Brake Unit		VXL1475	1	9				●				●
Supply Brake Solenoid		VSJ0091	1	12								●
Take up Brake Solenoid		VSJ0091	1	13								●
Pinch Solenoid		VSJ0069	1	14				●				●
A/C Head (AU-650B/640)		VED0078	1	15				●				●
A/C Head (AU-630)		VBR0134	1	15				●				●
Drum Unit (AU-650B) with Brush Unit & SLIP RING		VEG0601	1	16				●				●
Drum Unit (AU-640) with Brush Unit & SLIP RING		VEG0728	1	16				●				●
Drum Unit (AU-630) with Brush Unit & SLIP RING		VEG0731	1	16				●				●
Loading Motor		VRD0030	1	17								●
Loading Motor (small)		VEM0264	1	18								●
Leaf Switch		VSH0026	2	19								●
Intermediate Gear		VXP0757	1	20								●
Detector Base R Unit		VES0347	1	21								●
Detector Base L Unit		VES0479	1	22								●
Detector Base L Unit (previous type for AU-650B)		VES0346	1	22								●
Loading Motor Belt		VDV0156	1	23		●		●		●		●
Post Roller with Bearing	P1, P2, P11	VXP0820	3	24				●				●
	P7, P8, P9, P12	VXP0821	4	25				●				●
	P10	VXP0822	1	26				●				●
	P3, P4	VXP0823	2	27				●				●
	P5	VXP0824	1	28				●				●
	P6	VXP0819	1	29				●				●
Lower Frange		VMS2803	1	25								●
S. Tension Arm U (W/POST)		VXL1320	1	30						●		
T-Stopper Pin Base Unit		VXA2306	1	31						●		
Sub Loading Switch		VSM0042	1	32								●
Pinch Press Lever		VXL1285	1	33						◎		●
IP Base Unit		VXR0131	1	34								●
Fan Motor		VRF0037	2	—				●				●
Power Box Fan Motor		VRF0052	1	—				●				●
Eject Switch		VSP0221	1	—						●		
Carriage Illumination Lamp		VLL0019	3	—		●		●		●		●
Front Loading Motor		VEM0228	1	—								●
Front Loading Motor Belt		VDV0157	1	—		●		●		●		●
Loading Switch		VSM0048	2	—						◎		●

* VERY IMPORTANT
TR Encoder Unit should be replaced with above listed part accordance with maintenance schedule regularly.

MAINTENANCE PARTS LOCATION

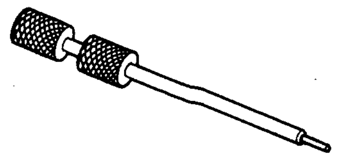


The specified fixtures and tools must be used to conduct adjustment requiring a fixture.

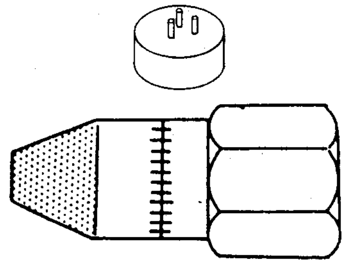
The following fixtures and tools a required to conduct complete Mechanical Adjustments.

Servicing Fixtures & Tools for Model AU-650B/640/630 Tool Kit No. VFK0356

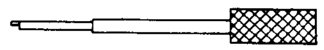
VFK0293 post driver



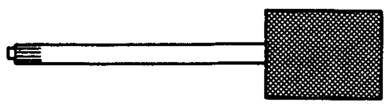
VFK0133 Dial Torque Gauge
VFK0134 Adaptor for VFK0133



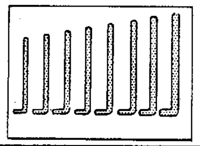
VFK0357 (φ1.5) Eccentric Screwdriver
VFK0358 (φ2)
VFK0359 (φ3)



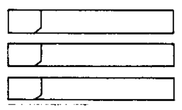
VFK0446 Fine Adjustment Screwdriver (3mmφ)



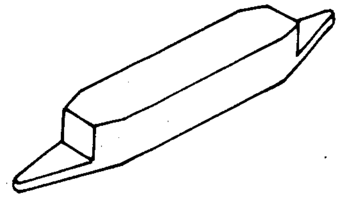
VFK0326 Hex. Wrench (Set)



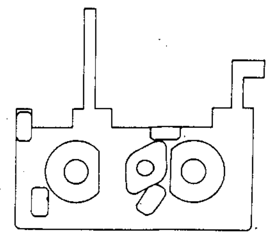
VFK27 Head Cleaning Stick



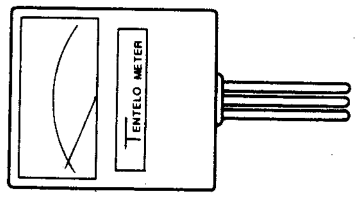
VFK0363 Post Height Fixture



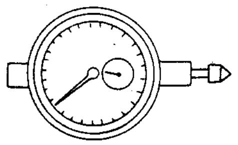
VFK0352 Mech Neutral Adjustment Plate



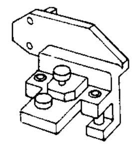
VFK0132 Back Tension Meter (Tentelometer)



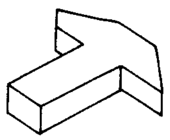
VFK0325 Dial Gauge



VFK0287 Head Adjustment Plate

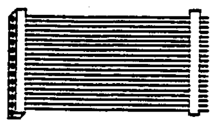


VFK0438 P2 Post Tilt Fixture



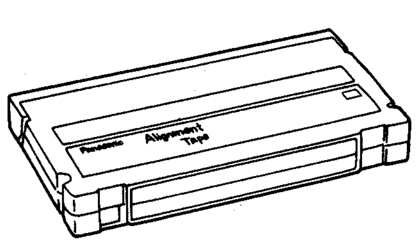
VFK0296 RT Gap Spacer

VFK0470 20Pin Extension Cable Set

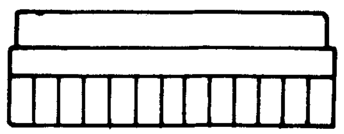


×6

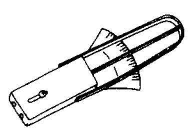
VFM7180EG Alignment Tape



VFK0361 Dummy Plug (1)
VFK0362 Dummy Plug (2)



VFK0566 Fan Type Tension Gauge



PURPOSE OF MAINTENANCE TOOL

Part No.	Purpose	Page No.
VFK0293	Tape Interchangeability Adjustment	2-15
VFK0133 • VFK0134	Brake Torque Adjustment	2-9
VFK0357	Horizontal Position of A/C Head Tension Adjustment	2-21 2-30
VFK0358	Timer Roller Position Adjustment Sub Loading Switch Adjustment Pinch Roller Solenoid Adjustment Brake Solenoid Adjustment Position of P1 Post Drive Rod	2-8 2-8 2-10 2-22 2-28
VFK0359	Brake Solenoid Adjustment Tension Adjustment	2-22 2-29
VFK0446	Horizontal Position of A/C Head Leaf Switch Adjustment Loading Completion Detect Photo Sensor Position Adjustment Unloading Completion Detect Photo Sensor Position Adjustment Cassette Detect Sensor Adjustment	2-21 2-25 2-28 2-28 2-32
VFK0326	Reer Motor Adjustment Timer Roller Height Adjustment A/C Head Adjustment Sub Loading Post Adjustment Tape Interchangeability Adjustment Cassette Prop Height Adjustment Small Cassette Props Height Adjustment Small Cassette Reel Table Height Adjustment	2-5 2-7 2-11 2-15 2-15 2-26 2-27 2-27
VFK0363	Tape Interchangeability Adjustment	2-15
VFK0352	Reel Motor Adjustment Tape Interchangeability Adjustment P2 Post Tilt Adjustment Cassette Prop Height Adjustment Small Cassette Prop Height Adjustment Small Cassette Reel Table Height Adjustment Take-up Tension Adjustment	2-6 2-15 2-18 2-26 2-27 2-27 2-30
VFK0132	Tension Adjustment	2-29
VFK0438	P2 Post Tilt Adjustment	2-18
VFM7180EG	A/C Head Adjustment Tape Interchangeability Adjustment A/C Head Adjustment	2-11 2-15 2-21
VFK0361	Tension Adjustment	2-30
VFK0566	Pinch Roller Pressure Adjustment	2-10

1. DISASSEMBLY METHOD

1–1. REMOVAL OF TOP PANEL

1. Turn power off before disassembly.
2. Unscrew the 4 screws (A) and remove the top panels. (figure 1–1)

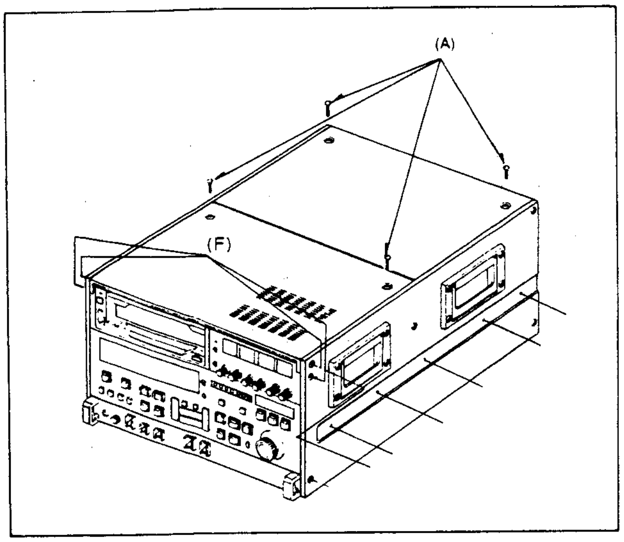


Fig. 1–1 Front Panel

1–2. REMOVAL OF THE FRONT LOADING UNIT

1. Remove the 4 screws (F) and pull the front panel forward. (figure 1–1)
2. Remove the 4 screws (B) and remove the carriage plate. (figure 1–2–1)

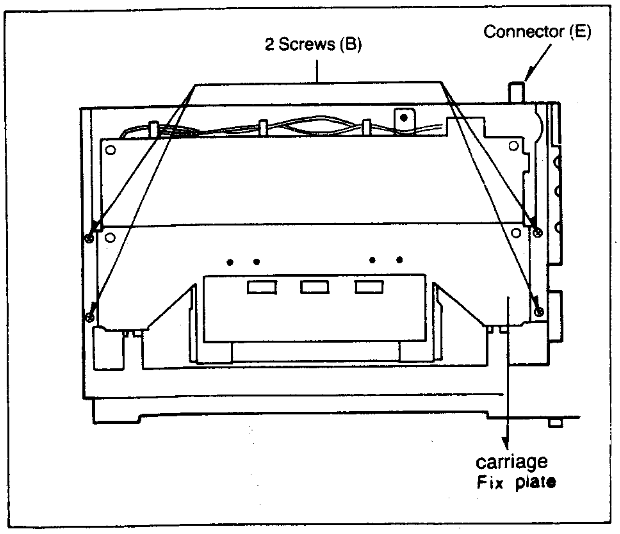


Fig. 1–2–1 Front Loading (1)

3. Remove the 2 screws (C) on the chassis as shown in figure 1–2–2.
4. Turn the front loading motor by hand until front loading is completed. (To expose screws "D", figure 1–2–2)
5. Remove the 2 screws (D) and connector (E) and then carefully lift the front loading unit up and remove.

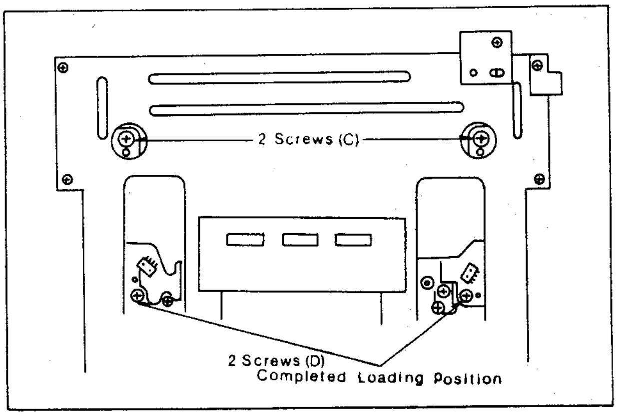


Fig. 1–2–2 Front Loading

1–3. REMOVAL OF THE BOTTOM PANEL

1. Unscrew the 9 screws (A) and remove the bottom panel (B).

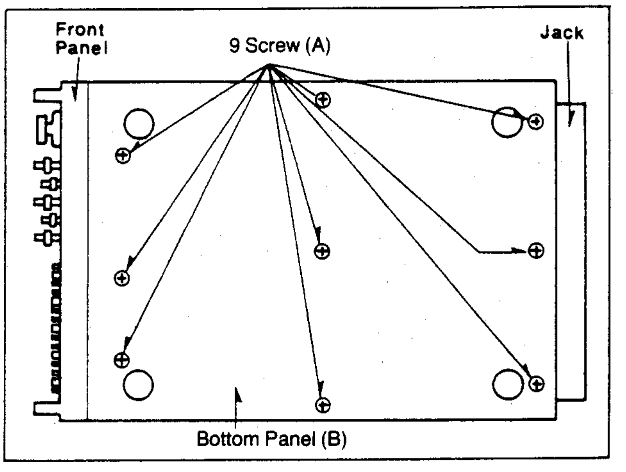


Fig. 1–3–1 Bottom Panel

2. Major Mechanism Parts Replacement Procedures

2–1. GENERAL

When mechanical parts are replaced, pay attention to the following notes:

(1) Always turn the power off before the replacement.
(2) If the adjustment is necessary after the part is replaced, perform the adjustment flowchart after replacement method.
(3) Use proper hand tools of fixtures.
(4) Be sure to clean the parts after replacement.

Also when the mechanical parts are replaced, follow the replacement procedures (sequences).

2-2. PINCH ROLLER REPLACEMENT

Removal

1. Push the ring drive gear (A) by using screw driver and move the loading ring counterclockwise so that the Pinch Roller reaches as shown in figure 2-2-1.
2. Remove the E-ring (C) by using the tweezers.
3. Remove the Pinch Roller unit (B).

Installation

1. Install a new Pinch roller unit and attach the spring as originally installed.
2. Turn the power on and insert a blank cassette. Playback the tape and observe the tape path. Be sure that no tape curling occurs at any post.

Note:
When replacing the pinch roller, be sure not to loose the washer.

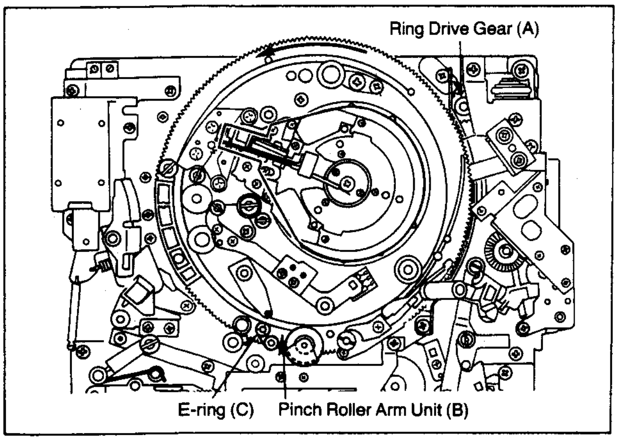


Fig. 2-2-1 Pinch Roller

2-3. CARRIAGE ILLUMINATION LAMP REPLACEMENT

Removal

1. Remove the 4 screws (A) and remove the carriage Fix plate (C).
2. Remove the 2 screws (B) and remove the LAMP cover.
3. Unsolder LAMP leads and remove the LAMP.

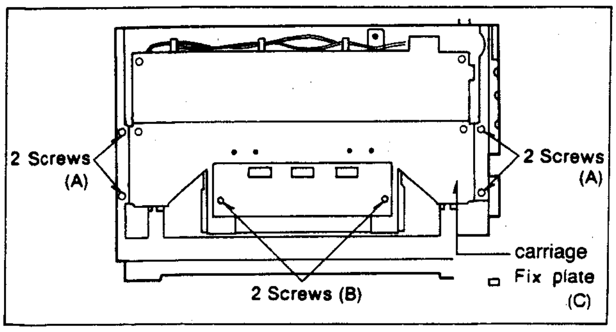


Fig. 2-3-1 Carriage Illumination

Installation

1. Reverse the previous steps.

2-4. FRONT LOADING BELT REPLACEMENT

Removal

1. Remove the belt from the wormgear shaft side pulley.
2. Remove the belt from the motor side.

Installation

1. I nstall the new belt in reverse order.
2. C lean the belt after replacement.

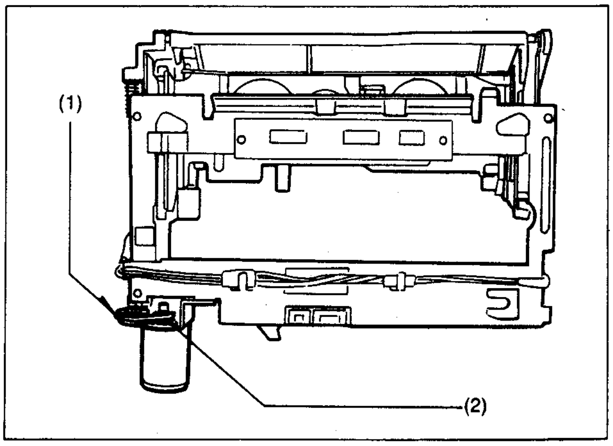


Fig. 2-4-1 Front Loading Belt

2-5. LOADING BELT REPLACEMENT

Removal

1. Remove the loading belt to direction (A) as shown in figure 2-5-1.

Installation

1. Put new loading belt onto the loading motor first as shown in figure 2-5-2.
2. Then put in onto the wormgear pulley as shown in figure 2-5-2.
3. Clean the belt after replacement.

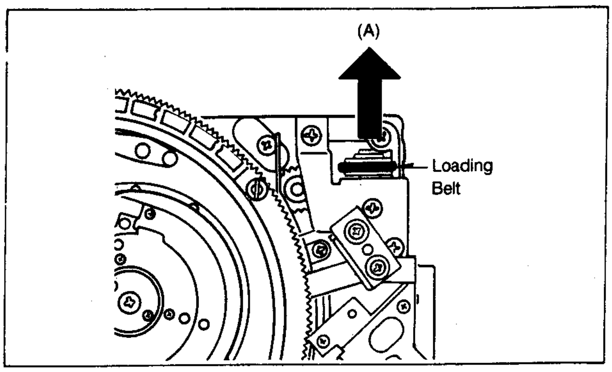


Fig. 2-5-1 Loading Belt (1)

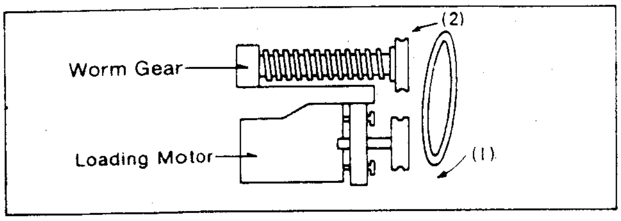


Fig. 2–5–2 Loading Belt (2)

2–6. CAPSTAN MOTOR REPLACEMENT AND ADJUSTMENT

2–6–1. Replacement

1. Remove the bottom Cover.
2. Disconnect connectors (A) (B) (C) and (D).

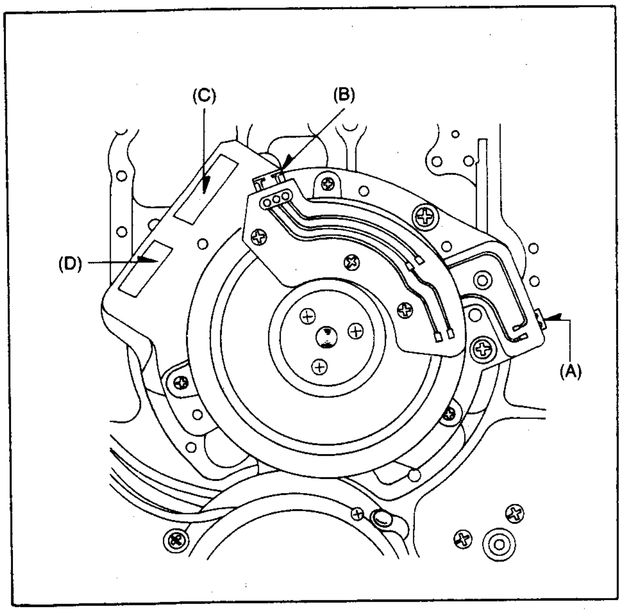


Fig. 2–6–1 Capstan Motor Connectors

3. From the top side, remove the 2 screws (E) and remove the full erase head unit.
4. Remove the screw (G), loosen the screw (H) and move the stopper lever (I) in the direction of the arrow.

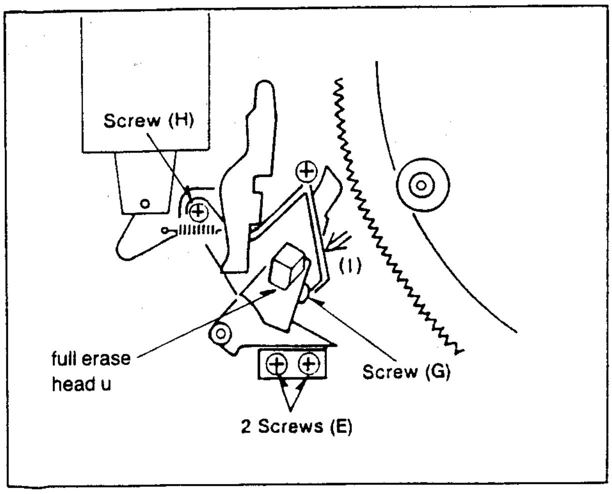


Fig. 2–6–2 Capstan Motor Unit

5. Remove the 3 screws (J) from the top side and remove the capstan motor from the bottom.

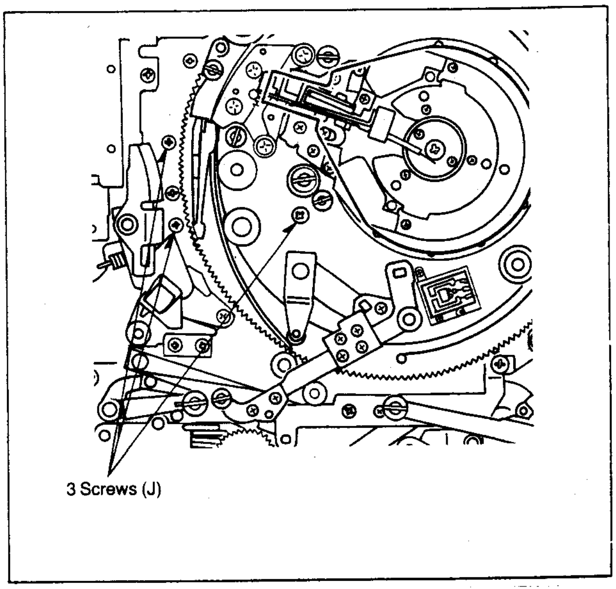


Fig. 2–6–3 Capstan Motor

Installation

1. Reverse the previous steps.

2–6–2. Adjustment

1. Make checkings and adjustments according to the following flow chart.

No.	ITEM (PAGE) AU-650B/640	AU-630	ADJUSTMENT NAME
1	2-13 (3-5)	2-13 (3-11)	Tracking Fix Confirmation and Adjustment

2–7. REEL MOTOR REPLACEMENT AND ADJUSTMENT

2–7–1. Replacement

Tool : Hex Wrench (VFK0326)

Removal

1. Remove the front loading unit.
2. Turn the small cassette loading motor by hand until the sub–loading gear is disengaged from the small reel table as shown in figure 2–7–1.

Note:

When the Intermediate Gear is removed, the small cassette holder base and take–up reel might be caught the Intermediate Gear.

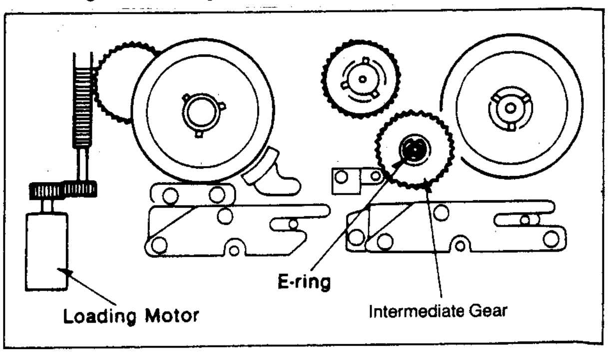


Fig. 2–7–1 Intermediate Gear

3. Remove the E–ring and remove the intermediate gear.
4. Loosen the 2 hex screws (A) and remove the supply and takeup reel tables and the 2 springs. (Be sure not to lose these springs)
5. Remove the bottom panel of the unit, capstan drive and power regulator board.
6. Disconnect the connectors (B) and (C).
7. Remove the 6 screws (D) and remove the reel motors as shown in figure 2–7–3.

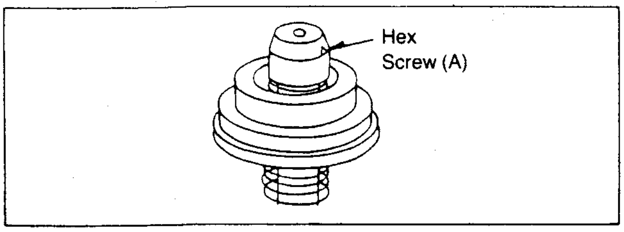


Fig. 2–7–2 Reel Table

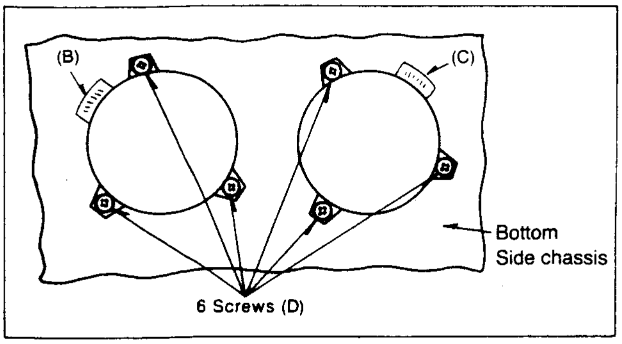


Fig. 2–7–3 Reel Motor

Installation

1. Follow the removal steps in inverse order.
2. Insert the reel table all the way in and fasten the hex screws (A) temporarily.
3. Perform the following adjustments.

2–7–2. Adjustment

* Tools Required
Mechanical Neutral Adjustment Plate (VFK0352)
Hex Wrench (1.5mm)

1. Loosen the2 Hex screws (A). Place the Mechanical Adjustment plate on the reel tables while releasing main brake by pushing the brake solenoid shaft by hand.
2. Tighten the hex screws (A) securely. (Height of the reel table is automatically set by spring action.)

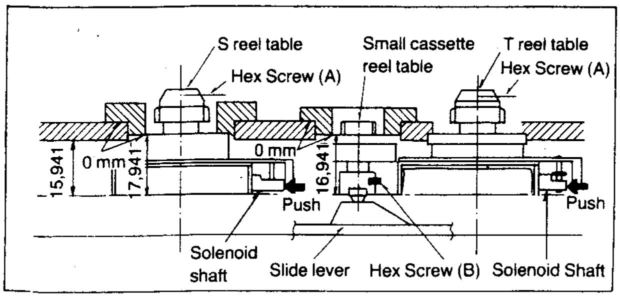


Fig. 2–7–4 Reel Table

3. Make electrical checkings and adjustments according to the following flow chart.

No.	ITEM (PAGE)		ADJUSTMENT NAME
	AU-650B/640	AU-630	
1	2-8 (2-8)	2-7 (2-5)	Reel Height Adjustment
2	2-31 (2-31)	2-30 (2-29)	Confirmation of Tape Tension
3	2-31-4 (2-32)	2-30-4 (2-30)	REV Search Tension Adjustment
4	2-31-4 (2-32)	2-30-4 (2-30)	FWD Search Tension Adjustment
5	2-31-4 (2-32)	2-30-4 (2-30)	High Speed Startup Torque Adjustment
6	2-31-4 (2-32)	2-30-4 (2-30)	X 32 Search Mode Adjustment
7	2-7 (3-4)	——	TR FG Duty Adjustment

2–8. FULL ERASE HEAD REPLACEMENT AND ADJUSTMENT

2–8–1. Replacement

Removal

1. Unsolder 2 leads on the erase head.
2. Remove the 2 screws (A) and remove the full erase head assembly.
3. Remove the screw (B) and remove the head.

Note:
Be sure not to lose the spacer. (C)

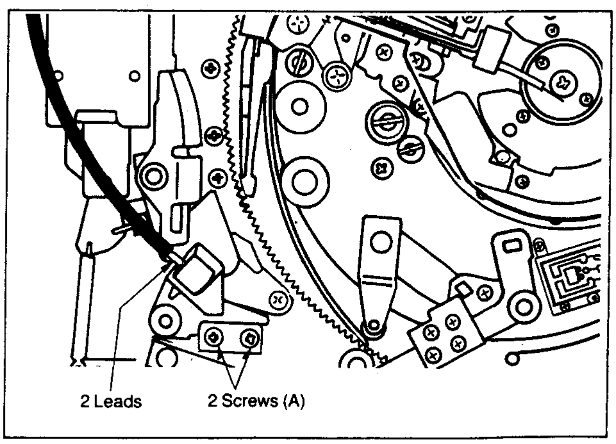


Fig. 2–8–1 Full Erase Unit

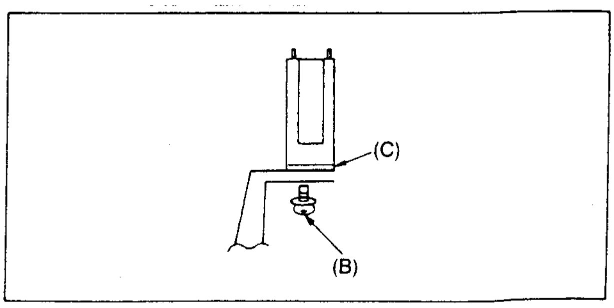


Fig. 2–8–2 Full Erase

Installation

1. After installing the head, perform the following adjustments.

2-8-2. Adjustment

1. Make checkings and adjustments according to the following flow chart.

No.	ITEM (PAGE)		ADJUSTMENT NAME
	AU-650B/640	AU-630	
1	13-13 (3-60)	——	Full Erase Current Adjustment

2-9. TIMER ROLLER REPLACEMENT AND ADJUSTMENT

2-9-1. Replacement

Tool : Hex Wrench (VFK0326)

Removal

1. Remove the front loading unit.
2. Remove the 2 screws (C) and remove the timer roller encoder P.C.Board (B) in the arrow direction as shown in figure 2-9-2.
3. Remove the flange (A) and remove the timer roller unit. (Be sure not to lose the spring. Do not loosen the hex screw)

Installation

1. Follow the removal steps in inverse order.
2. After the installation, perform the following adjustments.

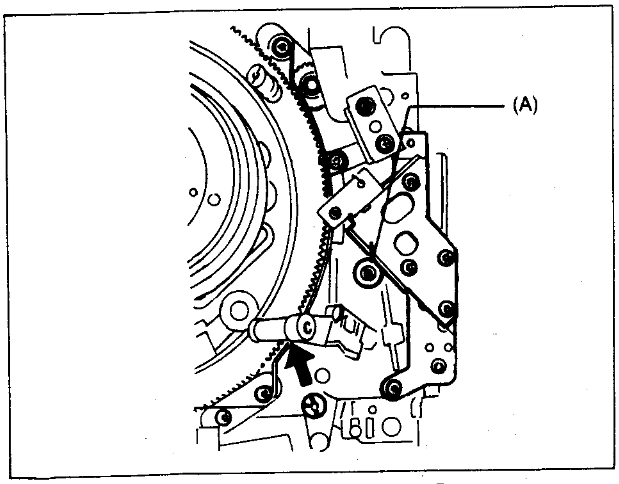


Fig. 2-9-1 Timer Roller Base

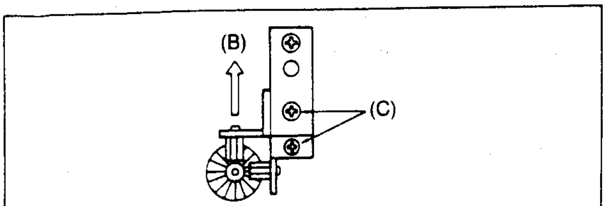


Fig. 2-9-2 Timer Roller

2-9-2. Adjustment

1). Timer Roller Height Adjustment

Tools Required :
Hex Wrench (VFK0326)

1. Play back the MPL90 tape to make sure the tape edges do not come into the gutters on the timer roller in any mode.
2. If the above requirement is not satisfied, loosen Hex-Screw (D) and turn nut (E) for height adjustment.
3. Finally, be sure to tighten up Hex-Screw (D).

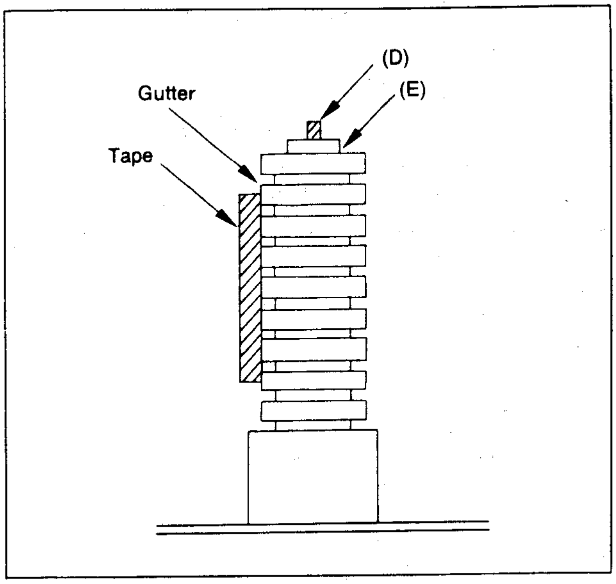


Fig. 2-9-3 Timer Roller Height

2). Timer Roller Position Adjustment

* Tools Required:
Eccentric Screwdriver (VFK0358)
Dual Channel Oscilloscope

1. Connect the scope CH1 to TP76 and CH2 to TP77 on the servo P.C.Board.
2. Insert a cassette and place the unit in the PLAY mode.
3. Loosen the 2 screws (C), as shown in figure 2-9-4.
4. Insert the eccentric screwdriver into hole (D) (figure 2-9-4).
5. Turn the eccentric screwdriver until the two waveforms are 90 degrees apart A=B as shown in figure 2-9-5.
6. Tighten the 2 screws (C).

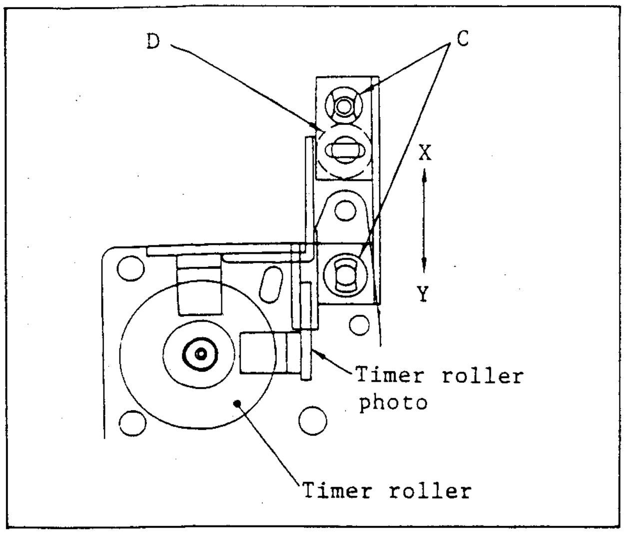


Fig. 2–9–4 Timer Roller

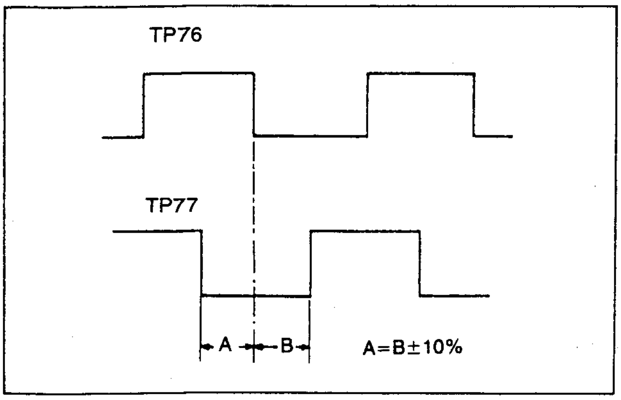


Fig. 2–9–5 Timer Roller Phase

3) Sub Loading Switch Replacement and Adjustment Replacement.

1. Unscrew the 2 screws (C) and remove the Sub Loading Switch (Micro SW) with Sub Loading adjustment plate as shown in figure 2–9–6.
2. Unsolder the 2 wires (E) on the Sub Loading Switch (Micro SW) as shown in figure 2–9–6.
3. Unscrew the 2 screws (F) and remove the Sub Loading Switch (Micro SW) from Sub Loading Adjustment Plate as shown in figure 2–9–6.

Installation

1. Install the new Sub Loading Switch (Micro SW) and follow the removal step in inverse order.

Adjustment

* Tool Required:
Eccentric Screwdriver (VFK0358)

1. Turn Power on. Insert a cassette and wait until tape loading completes.
2. Make sure that when the tape loading is completed, that the sub loading switch has activated. (Check that Load speed increases after switch closes).
3. If the switch does not activate, loosen the 2 screws (C), insert the eccentric screwdriver into hole (D), and adjust the position of the switch as needed. (figure 2–9–6)

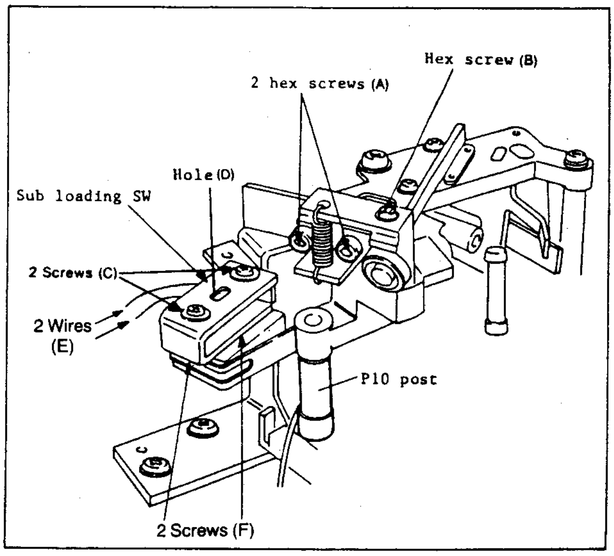


Fig. 2–9–6 Sub Loading

2–10. MAIN BRAKE REPLACEMENT AND ADJUSTMENT

2–10–1. Replacement

Removal

1. Remove the front loading unit.
2. Remove the spring (B) by using tweezers.
3. Remove the E–ring (K) and Remove the main brake (C).

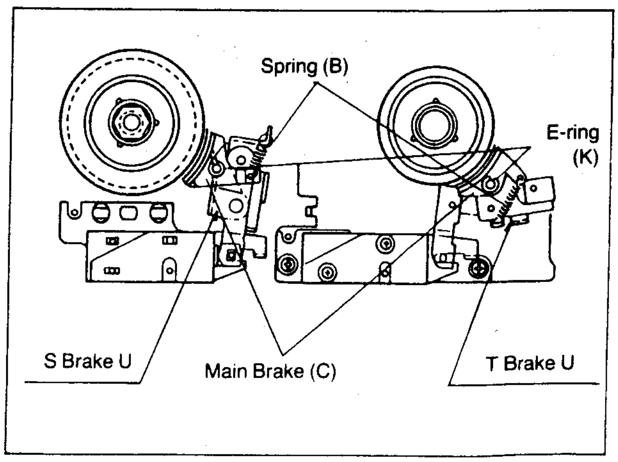


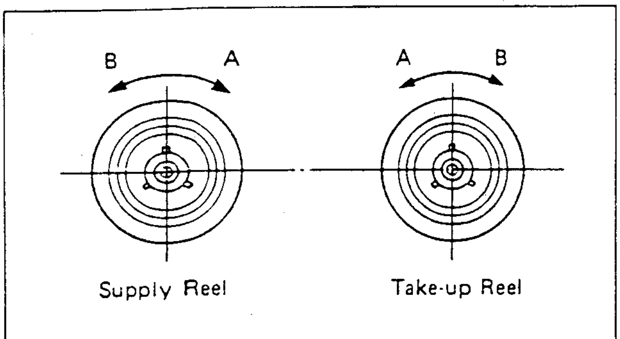
Fig. 2–10–1 Main Brake

Installation

1. Perform steps 3 and 2 in that order.

2-10-2. Adjustment (BRAKE TORQUE Adjustment)

* Tools Required:
Dial Torque Gauge (VFK0133)
Dial Torque Gauge Adaptor (VFK0134)



	A	B
Take-up	350∿550	80∿200
Supply	400∿600	150∿250

Fig. 2-10-2 Brake Torque Spec

1. Attach the dial torque adaptor to the dial torque gauge.
2. Place the dial torque gauge over the reel table. In making this measurement the weight of the gauge should not rest on the reel table.
(figure 2-10-3)
3. Float the gauge slightly above the flange of the reel table as shown in figure 2-10-3 and turn it in the direction indicated as shown in figure 2-10-2. The gauge should be read at the point where it begins to slip.
4. If out of specification, take the following corrective steps.
Supply side brake and Takeup side brake should replace the entire brake unit with a new one, as required.

Condition	Correspondence
If the specification is not as indicated in figure 2-11-2 on the A direction.	Change the position of the spring (Refer to figure 2-11-4.)
If the specification is not as indicated in figure 2-11-2 on the B direction.	Replace the brake unit.

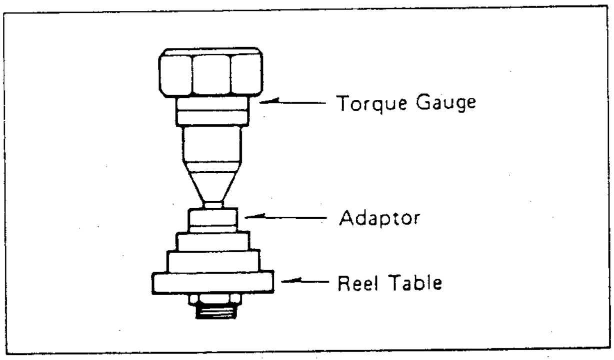


Fig. 2-10-3 Torque Gauge

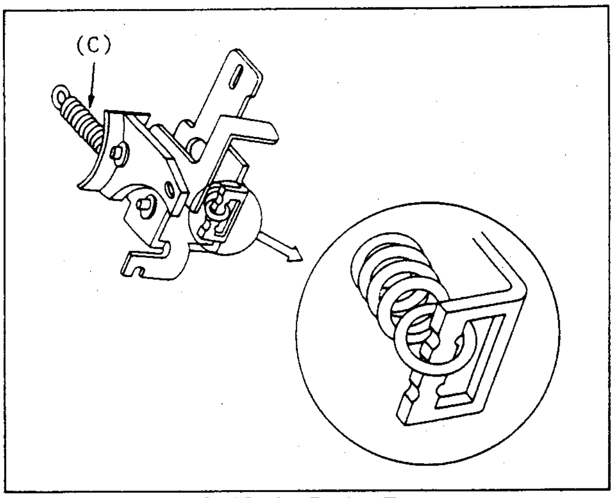


Fig. 2-10-4 Brake Torque

2-11. PINCH ROLLER SOLENOID REPLACEMENT AND ADJUSTMENT

2-11-1. Replacement

Removal

1. Remove the 3 screws (A) and disconnect the connector (P405) on the Mechanical Intermediate (2) P.C.Board.
2. Remove the pinch solenoid.

Installation

1. Follow the removal steps in inverse order.

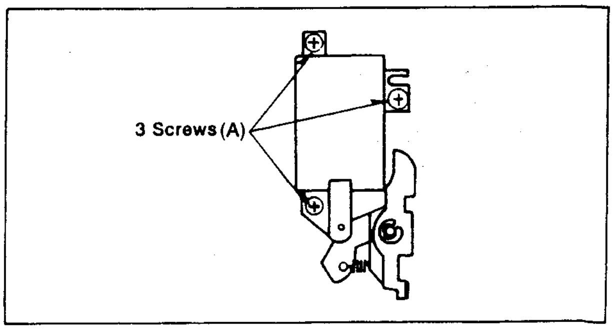


Fig. 2-11-1 Pinch Roller Solenoid

2-11-2. Adjustment

* Tool Required:
Eccentric Screwdriver (VFK0358)
Fan Type Tension Gauge (VFK66)
* Specification - 1.3mm +/- 0.2mm.

1. Play back a tape and measure the clearance (B) as indicated in figure 2-11-2. Verify that it is 1.3mm +/- 0.2mm.
2. If not, loosen the 3 screws (D) (figure 2-11-2) and insert the eccentric screwdriver into hole (C).
3. Adjust the Pinch roller solenoid position with the eccentric screwdriver so that the clearance (B) is 1.3mm (+/- 0.2mm).
4. Tighten the 3 screws (D).
5. Insert a work cassette and play back the tape.
6. Insert a 1.2mm thickness gauge to clearance (B).
7. Place the fan type tension gauge so that it's tip contactws the position (A) as shown in figure 2-11-2.
8. Push the tension gauge in the direction indicated by arrow Y in figure 2-11-2.
9. Confirm that the placed thickness gauge drop when the tension gauge reading is 1900 +/- 100 grams.
10. If this condition is not met, then change the poisition of the spring as indicated in figure 2-11-2.

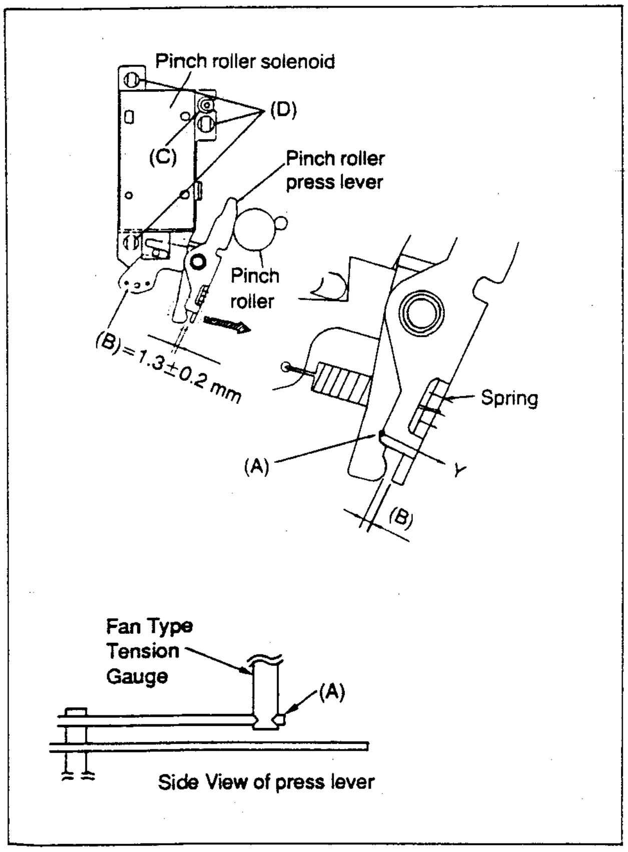


Fig. 2-11-2 Pinch Roller

2-12. A/C HEAD REPLACEMENT AND ADJUSTMENT

2-12-1. Replacement

Removal

1. It will be necessary to move the pinch roller from in front of the A/C head to aid replacement. The software has a program that will move the loading ring sufficiently CCW to allow cleaning and replacement. Without a tape, press any two of the three buttons above the search dial simultaneously. To exit this mode, hit "eject" or power off.
2. Remove the two screws (A) as shown in figure 2-13-1 and remove the A/C head assembly.
3. Remove the shield plate by removing two screws (B).
4. Unsolder leads as needed.

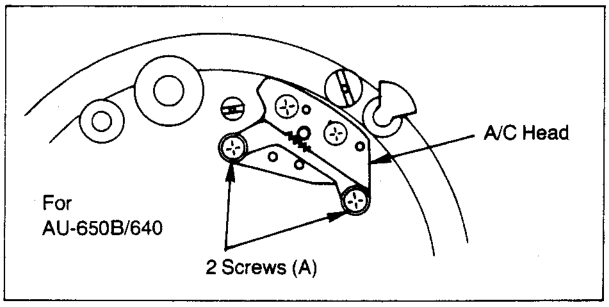


Fig. 2-12-1 (1) A/C Head Unit (For AU-650B/640)

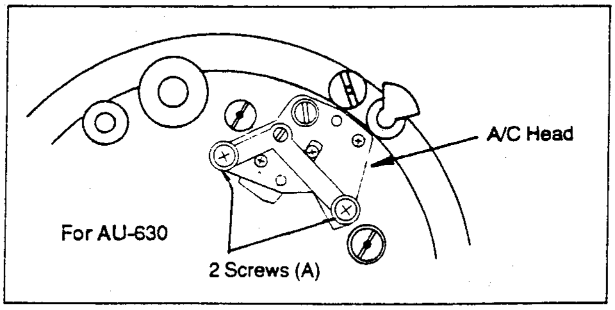


Fig. 2-12-1 (2) A/C Head Unit (For AU-630)

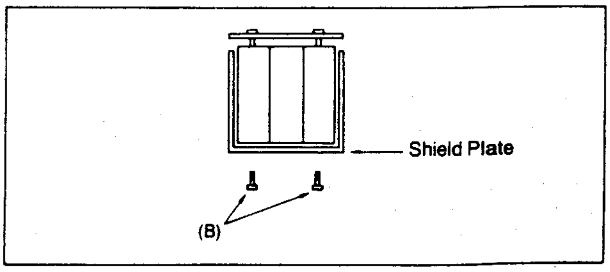


Fig. 2-12-2 A/C Head

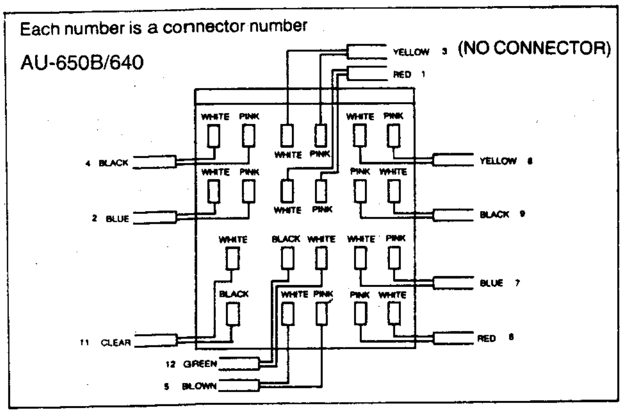


Fig. 2–12–3 A/C Head Connectors (For AU–650B/640)

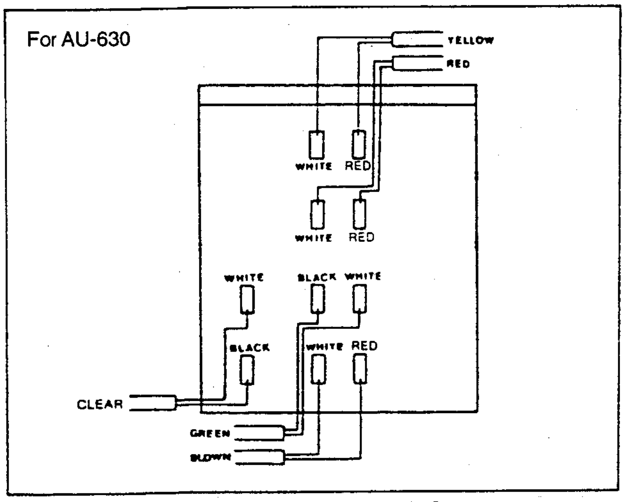


Fig. 2–12–3 (2) A/C Head Connectors (For AU–630)

Installation

1. Solder leads as needed. (refer to wiring drawing)
2. Reinstall the shield plate onto the A/C head assembly.
3. Install the new A/C head and tighten the two screws (A).
4. Clean the surface of the A/C head.

2–12–2. Adjustment

Tools Required :
Alignment tape
Hex Screw (1.27mm)

A/C HEAD (For AU–650B/640)

The A/C Head is held in a vertical position by 6 Allen Screws and screws (C). The 2 Screws (C) pass through 2 plain holes in the mounting plate and screw into 2 tapped holes in the top plate of the A/C Head. When both these screws are turned in the same direction they raise and lower the A/C Head. The 6 Allen Screws (A and B) fit into tapped holes in the mounting plate and their lower ends bear on the top of the head. These screws serve to tilt by screws (B) and azimuth by screws (A) the head in a plane orthagonal to the tape path. When raising or lowering the A/C Head all 6 screws must be adjusted at the same time, and slightly tighten the 2 screws (C) to keep snug enough to keep play to a minimum (figure 2–12–4 (1)).

A/C HEAD (For AU–630)

The A/C Head is held in a vertical position by 2 screws and 2 allen screws. The 2 allen screws pass through 2 plain holes in the mounting plate and screw into 2 topped holes in the top plate of the A/C Head.
When both these screws are turned in the same direction they raise and lower the A/C head.
Differential movement will adjust the head Azimuth.
The 2 allen screws fit into topped holes in the mounting plate and their lower ends bear on the top of the head. These screw serve to tilt the head in a plane orthagonal to the tape path.
When raising or lowering the A/C Head all screws must be adjusted at the same time, whilist however, keeping them snug enough to keep play to a minimum (figure 2–12–4 (2)).

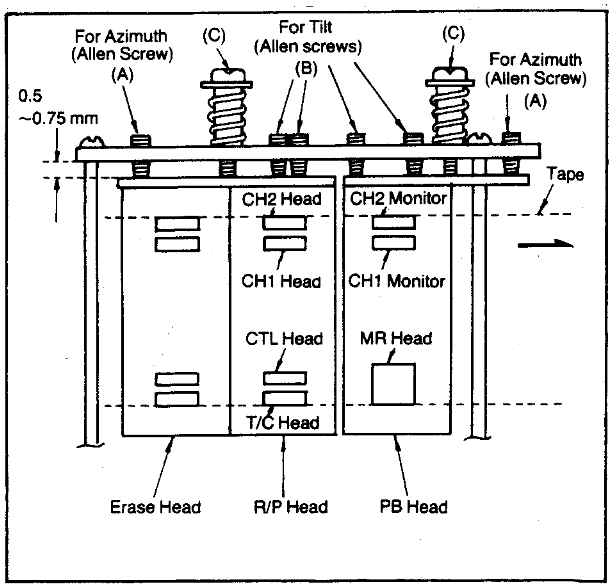


Fig. 2–12–4 (1) Construction of A/C Head (For AU–650B/640)

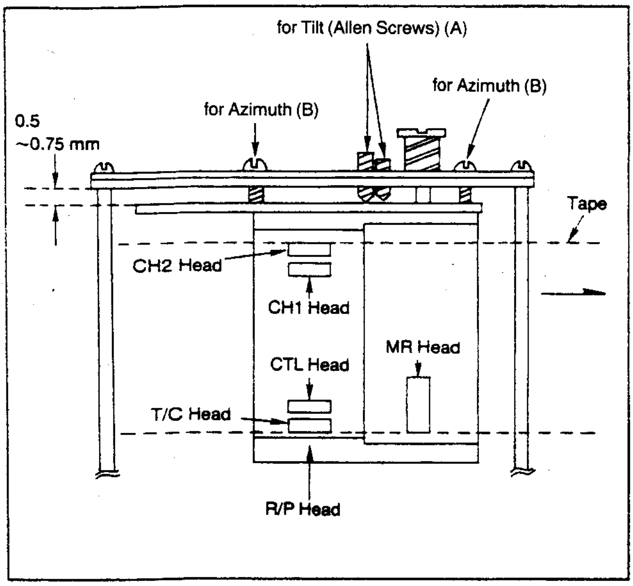


Fig. 2–12–4 (2) Construction of A/C Head (For AU–630)

Objective

To adjust the height, tilt and azimuth of the head in order to achieve maximum audio level in both channels with a minimum difference between the two whilst, maintaining the correct chroma RF envelope. As with all slow speed machines care must be used in adjusting Azimuth and the phasing must be checked at two audio frequencies to preclude the possibility of setting the two audio channels 360 degrees out of phase at 15KHz.

1). Effects of Adjustment of Allen screws (A and B) and screws (C) for AU–650B/640.
Effects of Adjustment of Allen screw (A) and screws (B) for AU–630.

1. Channel 1 Height

Raise or lower head for channel 1 maximum. Loosen and tighten all screws in increments. (figure 2–12–5)

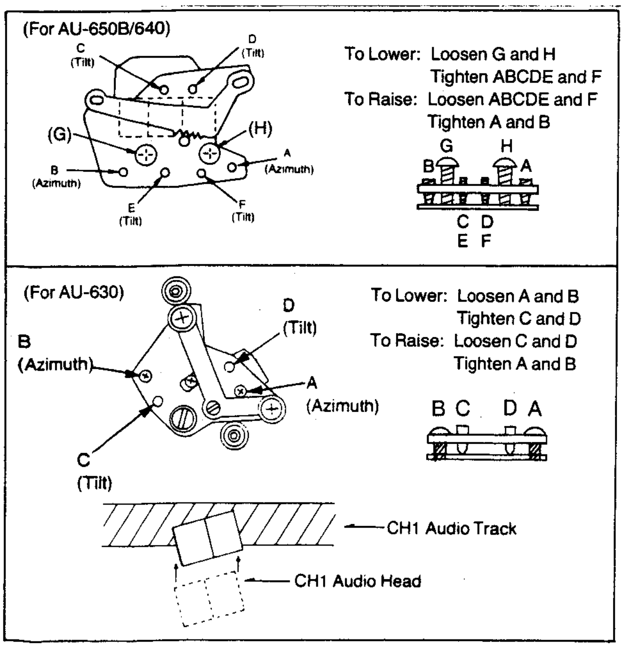


Fig. 2–12–5 Channel 1 Height

2). Channel 1 Azimuth (Check at 15KHz and 7.5KHz) (figure 2–12–6)

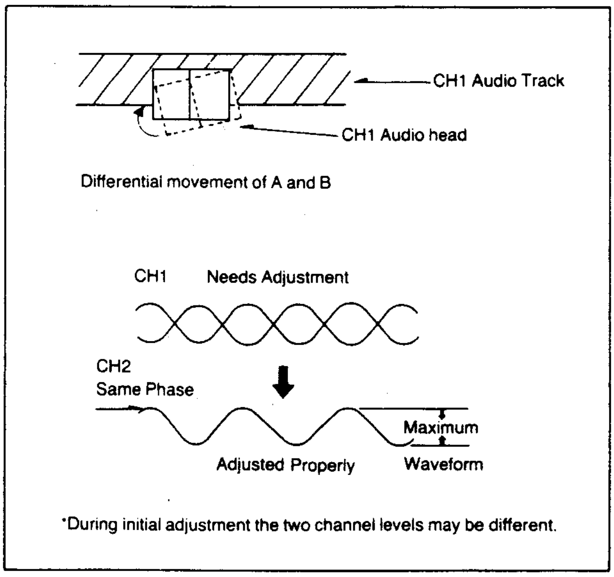


Fig. 2–12–6 Channel 1 Azimuth

Readjustment of height adjustment (figure 2–12–7)

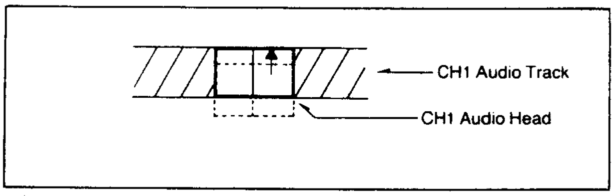


Fig. 2–12–7 Readjustment of Height

3). Channel 2 Tilt

1. Adjust tilt for maximum level in channel 2 after setting head height for maximum level in channel 1. (figure 2–12–8)

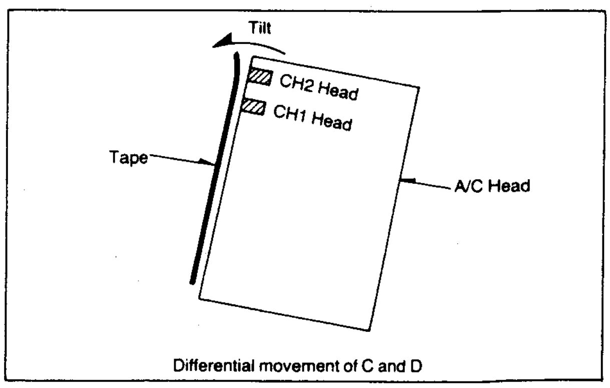


Fig. 2–12–8 Channel 2 Tilt

A/C HEAD Adjustment

*Caution : The AU−650B and 640 have a separated audio monitor head. When adjust the audio monitor head as same as R/P head, disconnect the SW 1 on the Audio Sub P.C.B. of the Audio 2 (S6) board to observe the output audio signal even in the normal playback mode which is not confidence playback mode.

Note:
Whilst adjusting this head it is necessary at all times to observe the Chroma RF Waveform and the amplitudes and relative phase of Audio Channels 1 and 2.

1. Check the separation between the head top−plate and the head mounting plate and set it to be between 0.5 and 0.75mm with the plates parallel. Check all Allen screws are set to the same height above the head mounting plate. (figure 2−12−9) and slightly tighten the screws (G) and (H).
2. Connect a WFM to the Video Waveform Monitor Output and observe Channel 1 and 2 Audio on a dual trace oscilloscope.
3. Play a prerecorded work tape containing 7.5KHz and 15KHz Stereo Tones and Colour Bars or a Flat Field Video Signal. Check that there is no tape foldover nor other tape deformation on P5, P6, P7 or P8.
4. Check that the bottom edge of the tape covers the Time Code Head and that the Servo is locked. If the Servo is not locked push gently on the upper or lower edge of the tape until the servo locks and then adjust the head height accordingly until the servo is locked.
5. Confirm that the 4 allen screws (C, D, E and E) of AU−650B/640 or 2 screws (A and B) and 2 allen screws (C, D) of AU−630 are same length as shown in figure 2−12−9.

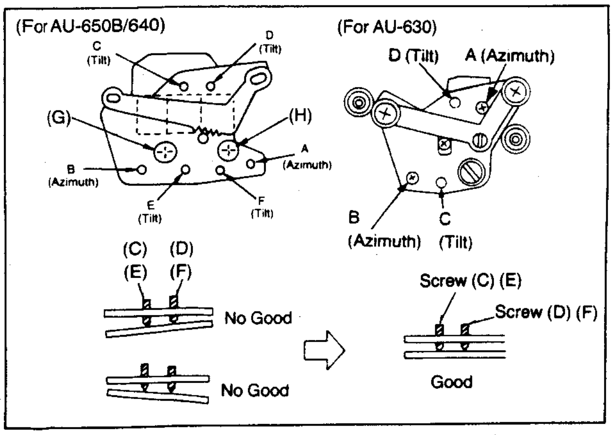


Fig. 2−12−9 Setting of Allen Screws

6. Adjust screw (B) until maximum audio level is achieved in channel 1.
7. Adjust head height by using all 6 screws of AU−650B/640 or all 4 screws of AU−630 maximum audio level is achieved in channel 1 keep all screws snug.
(In case of AU−650B/640, after adjust teh height slightly tighten the 2 screws (G and H) to keep snug.)
8. Adjust the head Azimuth for correct phasing between Channel 1 and Channel 2. Verify the phasing at 15KHz and 7.5KHz. Channel 1 and 2 levels may be different at first.
9. Recheck the head height to correct any errors introducted by changing the Azimuth.
10. Adjust the head tilt for maximum audio in Channel 2.

HOW TO CHECK THE TILT Adjustment

Check the upper edge of the tape between A/C Head and P5 post. If the audio level changes, tilt the A/C Head in the direction as shown in (A) of figure 2−12−10. If the audio level is stable even when the tension is increased, but the envelope is not flat, tilt the A/C Head as shown in (B) of figure 2−12−10.

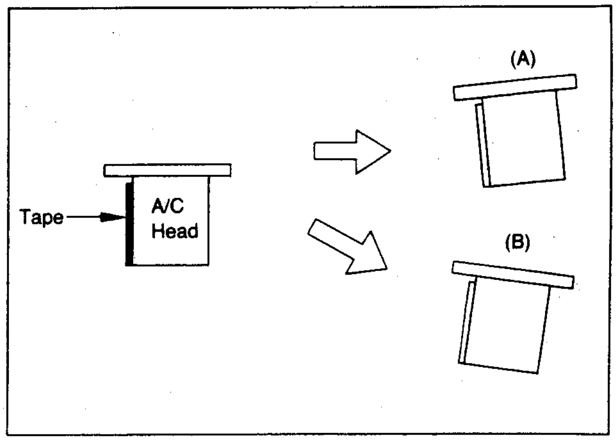


Fig. 2−12−10 A/C Head Tilt

11. Recheck head height and Azimuth to correct any changes introduced by changing the Tilt.
12. Repeat the above sequence from 8 through 12 until no further improvement can be obtained.
13. Place a standard alignment tape in the machine and verify items 8 through 12 until Channels 1 and 2 have minimum level and phase differences and the Chroma Waveform is correct. It may be necessary at this time to slightly readjust P5 to provide minor correction to the Chroma RF Waveform.
14. If the A/C Head tilt is incorrect, changes in supply tension can cause the audio output level to vary. Carefully push the P2 post in towards the head drum thus increasing the supply tension. If the A/C Head tilt is correct the audio level will remain stable or with only very minor variations.
15. P6 Post Height Adjustment
After the A/C head adjustment has been completed, observe the lower flange of the P6 post during playback. The bottom edge of the tape should just touch the lower flange of the P6 post. If not, adjust the height of the P6 post.

Note:
When the P5 and P6 post have to be readjusted due to tape curling or weaving, always recheck the playback RF envelope, A/C head height, tilt, and azimuth.

16. After confirmation or adjustment of the P6 post, place the unit in the reverse playback mode. Make sure that the bottom edge of the tape just touches the lower flange of the P6 post without tape curling. If tape curling occurs at the bottom flange of the P6 post, lower both P8 and P9 post slightly, then lower the P7 post until the tape curling disappears.

17. In the Rev x1 playback mode, if tape curling is seen at the lower edge of the P8 post, then raise the P9 post as needed.
18. In all modes (forward x1 to x32 reverse x1 to x32) tape curling should not occur at the flanges of the P6, P7, P8, and P9 posts. Readjust as needed if tape curling should occur.
19. Position P11 and P12 so that the tape path is in the middle of these post.

Note:
Make sure that all hex screws on the post are tightened securely.

20. Make electrical check and adjustments according to the following flow chart.

No.	ITEM (PAGE) AU-650B/640	ITEM (PAGE) AU-630	ADJUSTMENT NAME
1	2-13-2 (2-14)	2-12-2 (2-11)	A/C Head Height Adjustment
2	2-13-2 (2-14)	2-12-2 (2-11)	Linearity Adjustment
3	2-13-2 (2-14)	2-12-2 (2-11)	Audio Azimuth Adjustment
4	2-15 (2-23)	2-14-1 (2-21)	Horizontal Position of A/C HEAD Adjustment
5	2-20 (3-7)	2-20 (3-16)	PG Shifter Adjustment
6	13-4 (3-58)	11-1 (3-86)	Playback Equalizer Adjustment
7	13-5 (3-59)	11-2 (3-86)	Playback Level Adjustment
8	13-8 (3-59)	—	Playback Output Level Adjustment
9	13-13 (3-60)	—	Full Erase Current Adjustment
10	13-14 (3-60)	—	A/E Head Erase Current (1) Adj.
11	13-15 (3-60)	—	A/E Head Erase Current (2) Adj.
12	13-16, 16 (3-61, 62)	—	Audio Bias Current Adjustment
13	13-20 (3-62)	—	Recording Equalizer Adjustment
14	13-23 (3-63)	—	Monitor Playback Gain Adjustment
15	13-22 (3-63)	—	Monitor Playback Equalizer Adjustment
16	13-24 (3-63)	—	Crosstalk Cancel (CH1–CH2) Adjustment
17	13-25 (3-63)	—	Crosstalk Cancel (CH2–CH1) Adjustment
18	13-27 (3-64)	—	Recording Phase Adjustment
19	13-26 (3-64)	—	T/C Bias Current Adjustment

2–13. POST ROLLER UNIT REPLACEMENT AND ADJUSTMENT

2–13–1. Replacement

1). Post Roller Unit Replacement (Except P10 POST)

Note :
When you replace a Post roller unit post, please Install one at a time, and optimize its position. (Before replacing any mores)

Removal

1. Remove the front loading unit.
2. Remove the upper flange of the post. Do not loose the hex screw when the upper flange is removed.
3. Remove the post roller unit (B) (Be sure not to lose the post spring (D) as shown in figure 2–13–1.

Installation

1. Install new post bearing. (Pay attention to the post roller unit (B) installation)
2. Screw in the upper flange (A). (Do not touch to the hex screw)
3. Clean the post.
4. Play back blank cassette and check tape path. Then adjust the tape linearity.

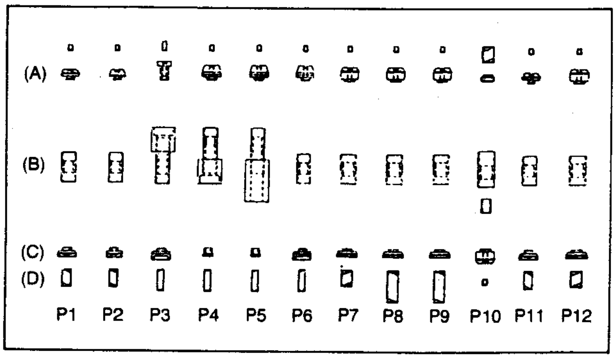


Fig. 2–13–1 Post Bearing

Note:
When replacing of the posts, don't remove and all posts at the same time.

2) Post Roller Unit Replacement (P10 POST)

Removal

1. Remove the E–ring (B) as shown in figure 2–13–2. (Do not drop the E–ring while removing it)
2. Remove the P10 post unit (A). (Do not lose spring and washers)
3. Refer to the previous post roller unit replacement section.

Installation

1. Refer to the previous post bearing replacement section.
2. Hook the spring (C) to the P10 post unit. Replace the E-ring (B).
3. Run a blank cassette and check tape path. Then adjust the height of P10 post.

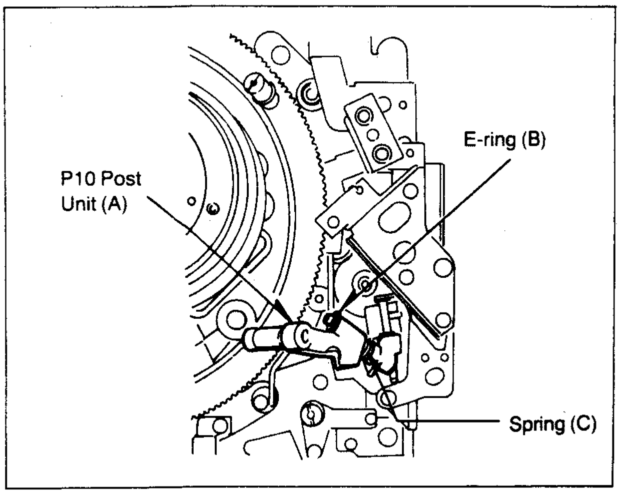


Fig. 2-13-2 P10 Post Bearing

2-13-2. Adjustment

1) Tilt Adjustment of P10 (SUB LOADING POST)

* Tool Required:
Hex Wrench (2.4mm) and (1.5mm)

1. Insert a cassette and press the VAR button.
2. While Rotating the search dial from end to end (−1 to +2 speed) observe the tape movement at the timer roller. The tape should not move upward or downward.
3. If it does, slightly loosen the 2 hex screws (A) and adjust the hex screw (B) (Refer to figure 2-13-3) as follows.

When the tape moves upward:
Turn the Hex screw (B) clockwise

When the tape moves downward:
Turn the Hex Screw (B) counterclockwise.

Note:
When the hex screw (B) is turned counterclockwise, the roller occasionally may not come up. If that is the case, move the roller by hand. (figure 2-13-3)

4. Press the SHTL button and move the search dial from end to end. Observe the tape movement at the timer roller. The tape movement (up or down) should only be slight.

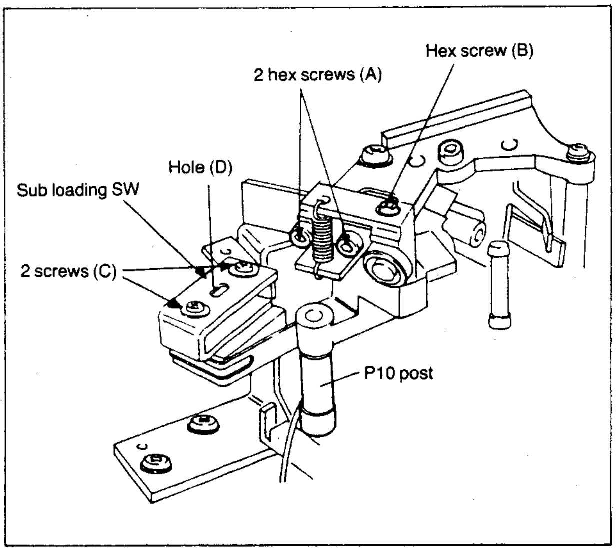


Fig. 2-13-3 Sub Loading

2). Tape Interchangeability Adjustment

Tools Required
Alignment tape
Post height fixture (VFK0363)
Mechanical Neutral Adjustment Plate (VFK0352)
Post Driver (VFK0293)
Hex Wrench (1.27mm)

GENERAL INSTRUCTIONS

* IMPORTANT NOTE :
When the interchangeability is adjusted at AU-630, please disconnect the connector P1 on the AT Board (S9) to stop the Auto Tracking function.

The objectives of this adjustment are as follows.

1. To insure smooth tape travel through the entire tape path without suffering any damage.
2. To obtain good interchangeability of tape among all units.

FIRST STEP

Play back a blank or pre-recorded tape and observe the tape path. Pay careful attention to all posts and make sure that tape curling or overriding of post flanges does not occur, use an inspection mirror to allow critical observation.

SECOND STEP

If no tape damage is occurring, then the alignment tape may be played back, and the RF envelope checked with an oscilloscope. The RF envelope should be flat. Envelope drop off is most likely to occur at the entrance and exit point (Head Switching) of tape travel around the drum. This is shown in figure 2-13-4 and careful attention should be paid to these points.

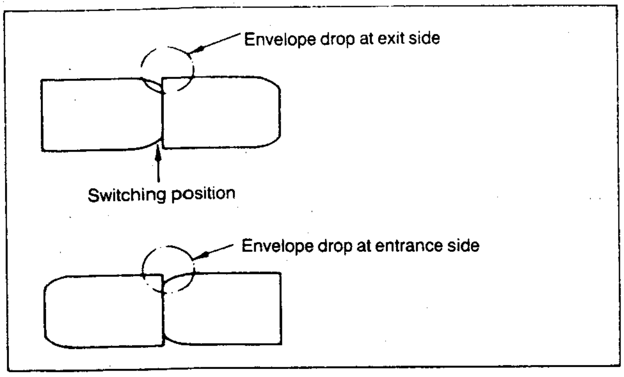


Fig. 2–13–4 Envelope Output

Figure 2–13–5 shows the recommended sequence of adjustments in flow chart form.

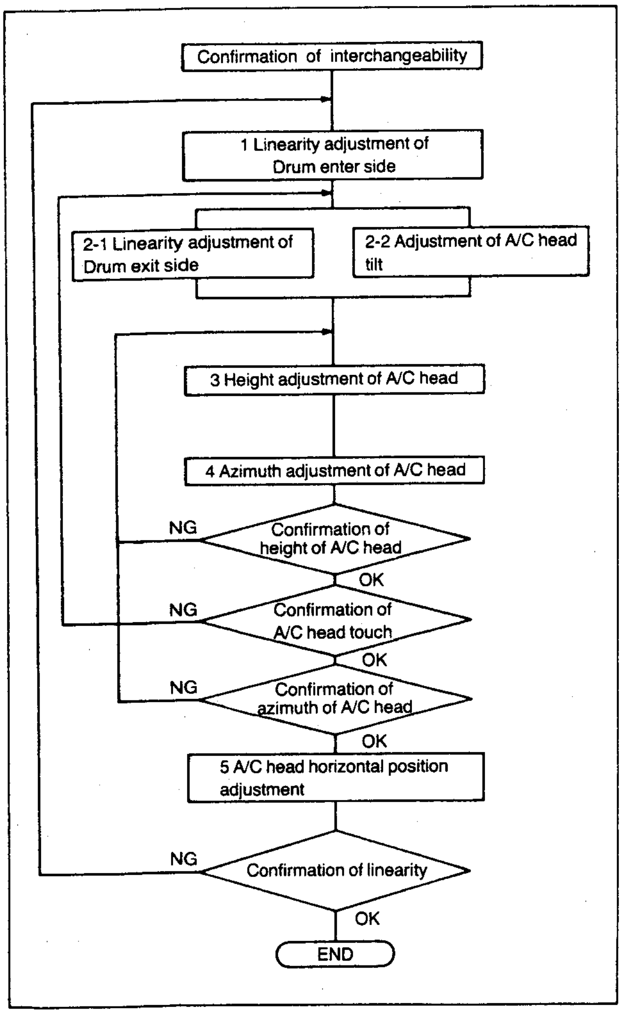


Fig. 2–13–5 Flowchart

Prior to doing the following adjustments, confirm the height of the P1, P2, P11, and P12 posts. In order to do this, remove the front loading unit, and install the mechanical neutral adjustment plate over the reel tables. Then place the post height fixture on the Mechanical Neutral Adjustment Plate, as shown in figure 2–13–9. The upper and lower flanges of the P1, P2, P11, and P12 post should confirm to the drawings indicated as good, in figure 2–13–9. Adjust the post height as needed.

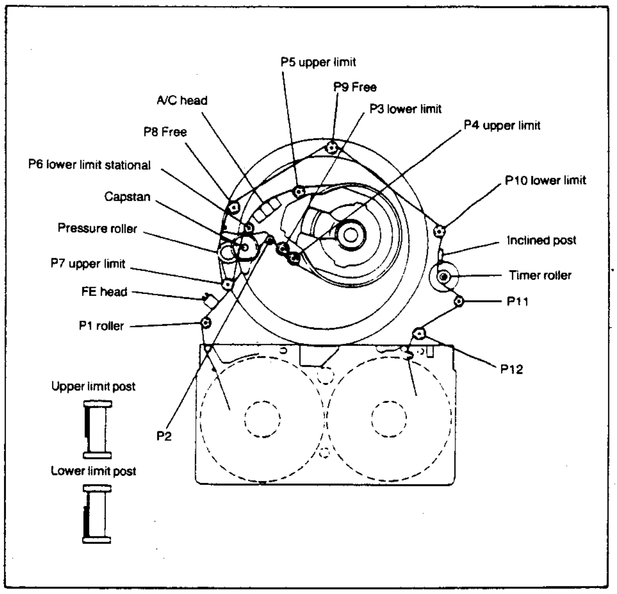


Fig. 2–13–6 Position of Posts

*P3 POST HEIGHT ADJUSTMENT

MODE : PLAY (alignment tape)
SPEC : 3/4 of a turn (CCW) from lower limit (0.3mm down)

ADJUSTMENT PROCEDURE

1. Turn the P3 upper frange to CCW so that the tape lower edge touches the P3 lower frange. (At that time, verify that the envelope entrance side is no changing.)
2. Turn the upper frange of P3 post to 3/4 CW (0.3mm down) as shown in figure 2–13–7 (A).

Name of post	Height adjustment	Tilt adjustment	Tape path limit	Note
P1	○		Upper limit	Use fixture.
P2	○	○	Upper limit	Use fixture.
P3	○		*Free	Perform only after P2 adj.
P4	○		Upper limit	Perform only after P2 adj.
P5	○		Upper limit	This adjustment is playback only.
P6	○		Lower limit	This adjustment is playback only.
P7	○		Upper limit	
P8			Free	
P9			Free	
P10	○	○	Lower limit	
P11	○		Center	Use fixture.
P12	○		Center	Use fixture.

Fig. 2-13-7 Tape Path Limit Table

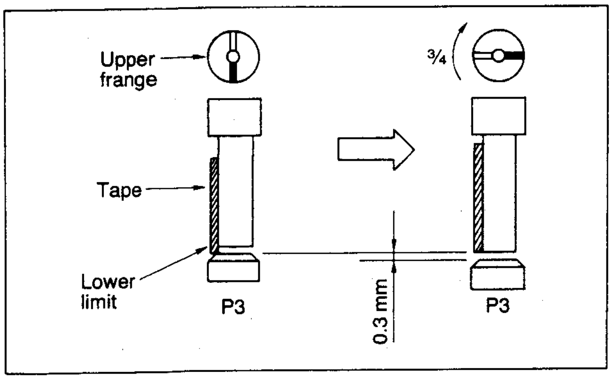


Fig. 2-13-7 (A) P3 POST HEIGHT ADJ.

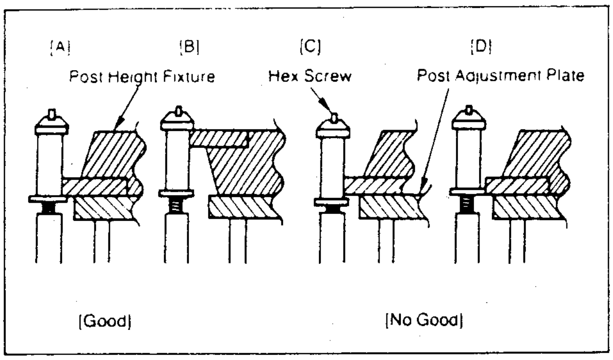


Fig. 2-13-9 Tape Guide

Note:
The set screw in the center of the top of each post should be loosened before adjusting each post and tightened afterward. Also make sure that no change in height occurs when the set screw is tightened.

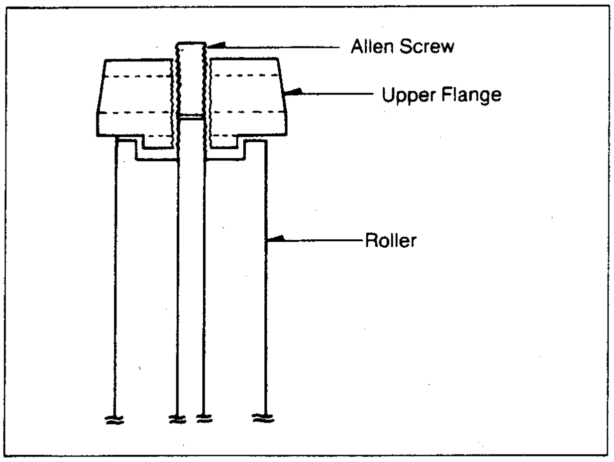


Fig. 2-13-10 Construction of Post

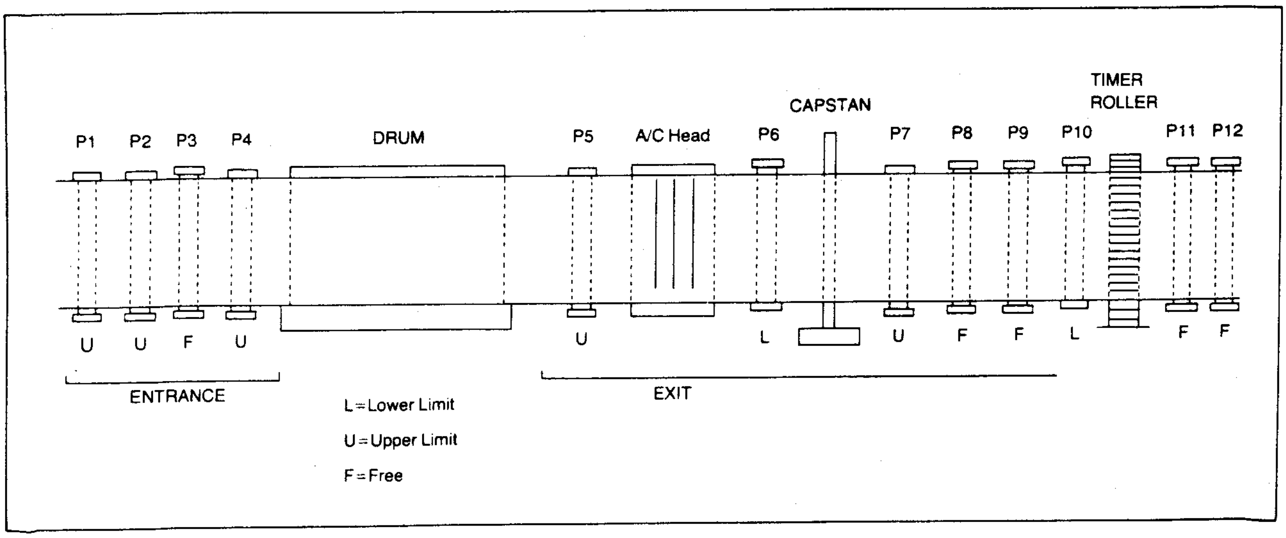


Fig. 2-13-8 Tape path Limit

Entrance Linearity Adjustment

1. Remove the front loading unit, reconnect the connector (P406) to the cassette removed front loading unit. Put the alignment tape to the unit, insert a work cassette to removed front loading unit to make loading mode. Connect the oscilloscope to WFM OUT and select C RF with the WFM SELECT on the pull out drawer. Use TP40 on the Servo Board to trigger the scope.
2. Play back the linearity adjustment segment of the alignment tape.
3. Adjust both the P3 and P4 post so that their flanges do not touch the top or bottom edge of the tape as follows.

   P3 POST
   Loosen the hex screw, then turn the P3 post clockwise so that it's lower flange does not touch the bottom of the tape.

   P4 POST
   Loosen the hex screw, then turn the P4 post counterclockwise so that it's upper flange does not touch the top edge of the tape.

4. Adjust the tilt and azimuth of the P2 post so that the following requirements, are met.

1). Checking/adjustment of clearance between P2 post and spring plate.

Note:
This adjustment should be done only when the P2 post, together with its arm, has been replaced.

1. Make sure there is a clearance of 0.05–0.2mm between pin B and spring plate (A).

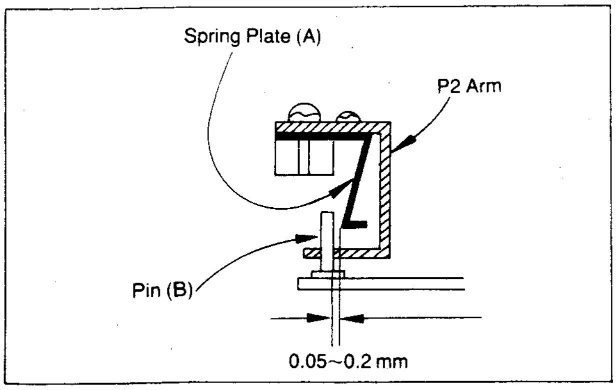


Fig. 2–13–11 P2 Post Spring Plate

2. If out of specification, loosen screws (C) and turn them to obtain the above–mentioned clearance. See figure 2–13–12.

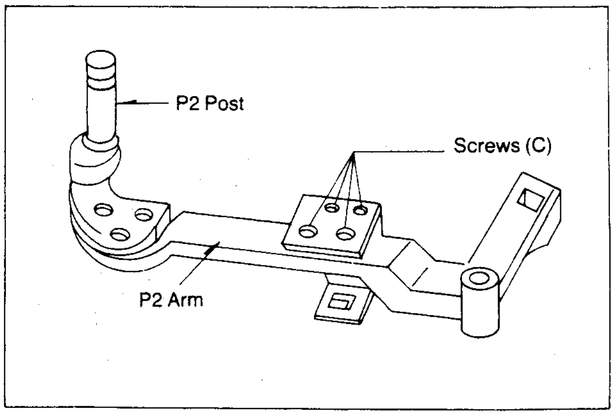


Fig. 2–13–12 Spring Plate Clearance

3. Finally, tighten up these screws. (Recheck tolerance)

2). P2 Post Tilt Adjustment (coarse)

Tools Required:
P2 Post tilt Fixture (VFK0438)
Mechanical Neutral Plate (VFK0352)

1. Using the mechanical neutral plate, remove thumbscrews A and B. And detach C and D. (See figure 2–13–13.)

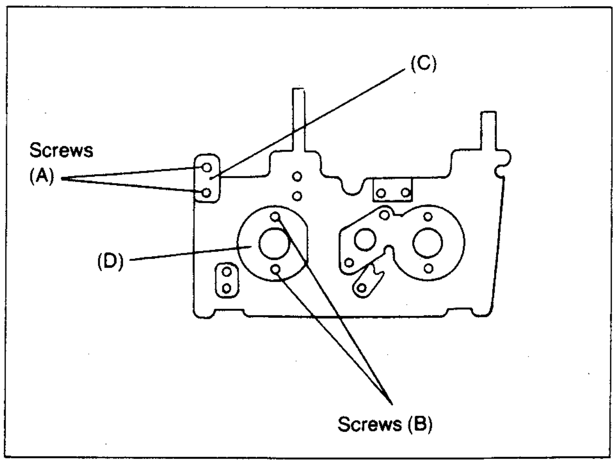


Fig. 2–13–13 Mech Neutral Adj. Plate

2. Set the P2 post tilt fixture (VFK0438) to the left end of the mechanical neutral adjustment plate. (See figure 2–13–14.)
3. Bring the P2 post tilt fixture's face (E) and face (F) into contact with the P2 post. Shed light from the direction of arrow, and look at the contact area from the opposite side to make sure there is no light coming through.

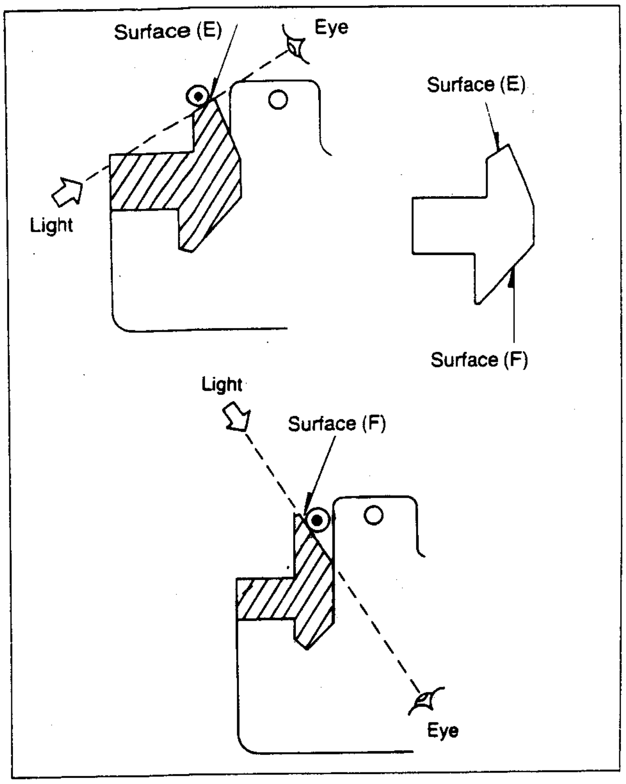


Fig. 2–13–14 P2 Post Tilt confirmation

4. If there is a gap, retighten screws (G) and use hex–screw (H) to readjust the tilt until the faces (E) and (F) become tight. (see figure 2–13–15.)
(Refer back to step 3 for rechecking.)

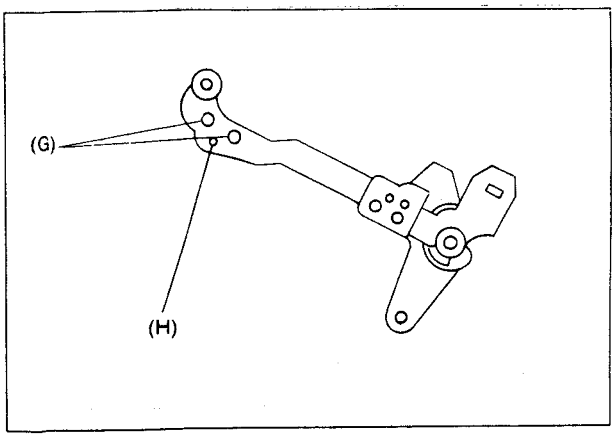


Fig. 2–13–15 P2 Post Tilt Adjustment

5. After this rough adjustment, take the following steps for fine adjustment; Items 3), 4) and 5).

   a. Upper flange of the P2 post just touches the top edge of the tape. Use an inspection mirror for this observation.
   b. Lower edge of the tape has more tension than the upper edge.
   Touch the back side of the tape gently with a finger to judge this condition. The top edge should have more "give" than the bottom edge.
   c. A flat envelope is output as shown in figure 2–13–16.

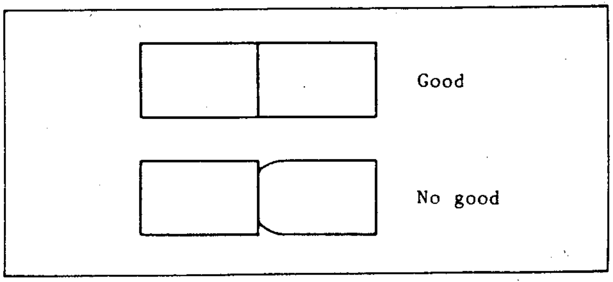


Fig. 2–13–16 Envelope Output

Note:
While observing the envelope rotate the tracking control. The envelope should remain flat without drop off at the head switching area as the entire envelope decreases.

Note:
If the P2 post is tilted too much, tape damage will occur.

3). If tape weaving (or slack) is seen at the top of the tape.

Slightly loosen the 2 screws (a) and (b) (as shown in figure 2–13–17 by the same amount and turn hex screw (c) clockwise so that the P2 post tilts in the y direction. (figure 2–13–17)

Loosen the screw (b) slightly and tighten screw (a). This makes the P2 post slant in the –x direction. (figure 2–13–17)

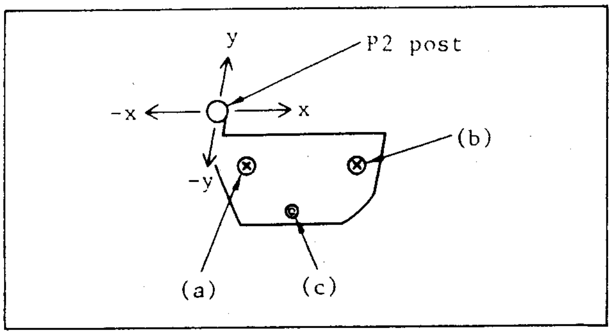


Fig. 2–13–17 P2 Post

4). If tape weaving (or slack) can be seen at the lower portions of the tape, turn the screw (c) counterclockwise and tighten both screws (a) and (b) an equal amount. This causes the P2 post to tilt in the –y direction. (figure 2–13–17)

Loosen the screw (a) slightly and tighten screw (b). P2 post will then tilt in the X direction. (figure 2–13–17)

5). In order to check the P2 post adjustment, perform the following test.

Gently press down on the upper edge of the tape as shown in figure 2–13–18. Displace the tape as necessary to achieve the (B) waveform in figure 2–13–19.

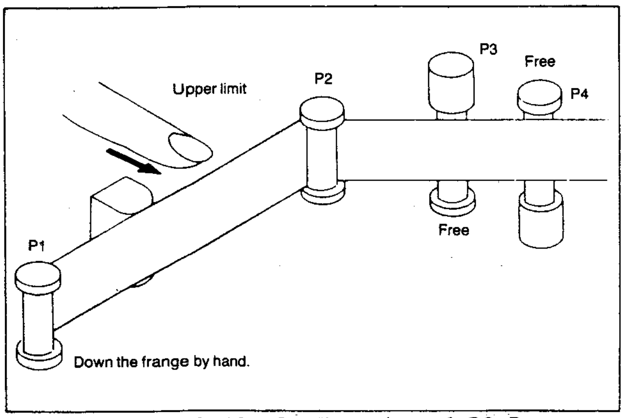


Fig. 2–13–18 Confirmation of P2 Post

Then release the tape.
The envelope will change from (B) to (C) and back to (A). (figure 2–13–19)

If the P2 post is properly adjusted, it will take from 1 to 2 seconds to change from (B) to (C) to (A).

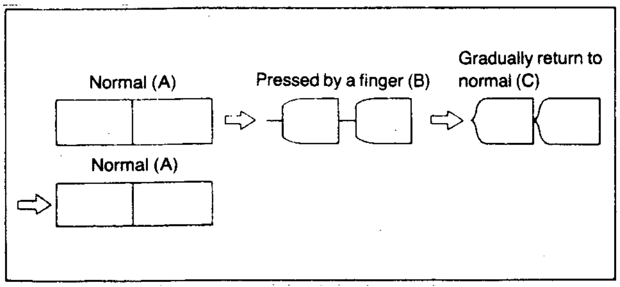


Fig. 2–13–19 Envelope Output

If there is not enough tilt to the P2 post, it will take more than 2 seconds for the envelope to change from (B) to (C) to (A). If this the case readjust the P2 post.

If the P2 post has too much tilt, it will take less than 1second for the envelope to change from (B) to (C) to (A). Adjust the P2 post to achieve a settling time of 1 to 2 seconds.

Insert a pre–recorded tape, place the unit in the FF/REW mode. Confirm that the envelope does not drop at the entrance side while the FF/REW mode.

After the P2 post has been adjusted, make sure that the screws (a), (b) and (c) are tight.

5. Reposition the P3 post so that the lower flange of the P3 post just touches the bottom edge of the tape as shown in figure 2–13–20. Tighten the hex screw to lock this adjustment.

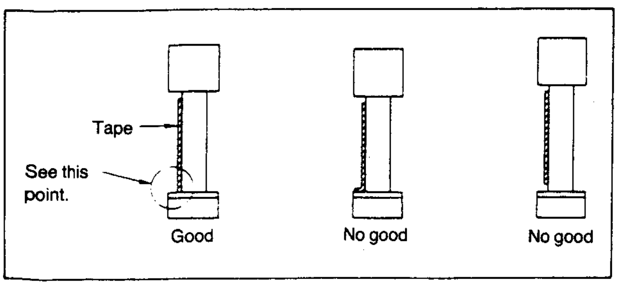


Fig. 2–13–20 P3 Post Height

6. Reposition the P4 post so that it's upper flange just touches the top edge of the tape as shown in figure 2–13–21. Tighten the hex screw to lock this adjustment.

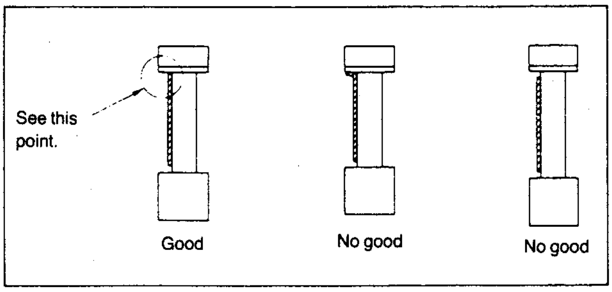


Fig. 2–13–21 P4 Post Height

Exit Linearity Adjustment

Note:
Both P5 and A/C head affect the RF envelope and the audio level. They must be adjusted together.

1. The oscilloscope setting is the same as for the entrance linearity adjustment.
2. First play back a blank or pre–recorded tape in the forward and reverse x1 mode and observe the tape at the P5 post. Make sure that no tape curling occurs at the P5 post, Also the upper edge of the tape should just touch the top flange of the P5 post. Adjust the P5 post as necessary.
3. P5 post height adjustment. (Observe the envelope).

(1). Play back the linearity segment of the alignment tape. If the envelope is as shown in figure 2–13–22, lower the P5 post slightly so that the envelope becomes flat.

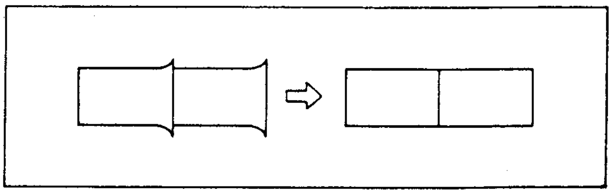


Fig. 2–13–22 Envelope Out

(2). If the envelope appears as in figure 2–13–23, raise the P5 post until the envelope is flat.

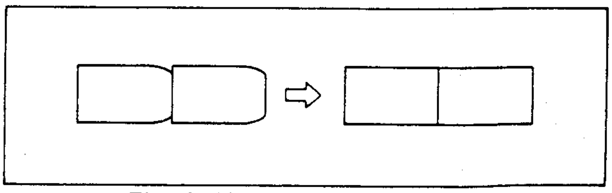


Fig. 2–13–23 Envelope Out

(3). If the envelope is as shown in figure 2–13–24 both the height of the P5 post, and the tilt of the A/C head will require adjustment.

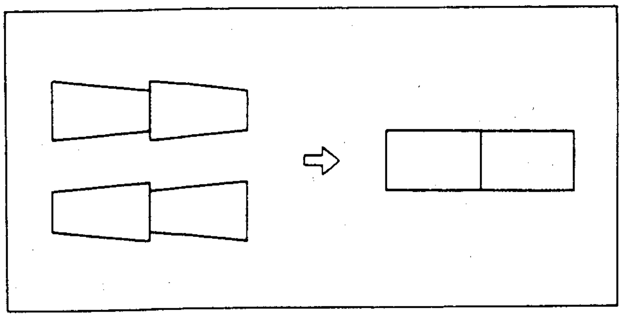


Fig. 2–13–24 Envelope Out

(4). After adjustment of the P5 post, confirm that the A/C Head tilt, azimuth and height adjustment is correct. Check also, that P6 to P12 is correct (Refer to section 2–12–2).

2–14. TRACKING FIX ADJUSTMENT (Electrical) (For AU–630 only)

Note :
This adjustment should be performed before Horizontal Position Adjustment. After adjust VR20, do not readjust it.

Test Point : TP11 (L5 SERVO P.C.B.)
TP40 (L5 SERVO P.C.B.)

1. Insert the alignment tape and play back a linearity portion.
2. Connect the scope CH1 to TP11 and CH2 to TP40 on the SERVO P.C.B..
3. Set the horizontal rate of the scope so that the A period becomes 9 scales as shown in figure 2–14–1.
4. Adjust VR20 so that the falling edge of TP11 is 3 scales from the raising edge of TP40.

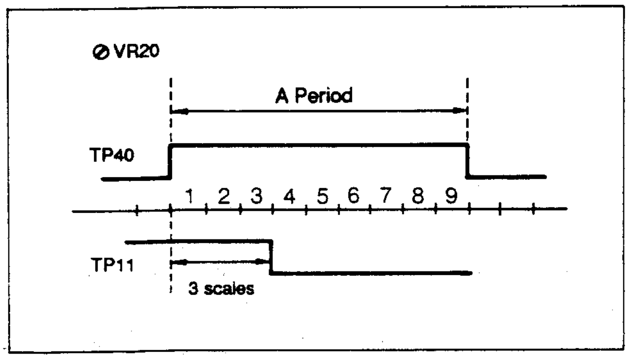


Fig. 2–14–1 Tracking Fix Adjustment

2–14–1. HORIZONTAL POSITION OF A/C HEAD

* Tools Required:
Fine Adjustment Screwdriver (VFK0446)
Eccentric Screwdriver (VFK0357)
Alignment Tape

Note:
Before this adjustment is performed, envelope output, A/C head height and azimuth, and tracking fix adjustments should be confirmed or completed. (Refer to tracking fix electrical adjustment)

(For AU–650B/640)

1. Insert the alignment tape, and play back the Field Skip portion.
2. Set the tracking control on the front panel to the detent position.
3. Connect CH1 of the oscilloscope to WFM OUT and CH2 to AUDIO CH2 OUT on the rear panel.
4. Select C RF with the WFM SELECT on the pull out drawer.
5. Loosen the 2 screws (A) a 1/4 of a turn and insert the fine adjustment screwdriver into hole (B) as shown in figure 2–14–2.
6. Adjust the A/C head assemble by turning the fine adjustment screwdriver to make the envelope level maximum, and the skip portion in the same position as shown in figure 2–14–1.
7. Tighten the 2 screws (A).

(For AU–630)

1. Turn the power off.
2. Disconnect the connector P1 on AT Board (S9) to stop the auto tracking function.
3. Turn the power on.
4. Insert the alignment tape, place the unit in the PLAY mode.
5. Play back the linearity portion of the alignment tape. Place the tracking control on the front panel to center petent position.
6. Connect the scope CH1 to WFM OUT and CH2 to AUDIO CH2 OUT on the rear panel.
Use TP40 on Servo Board (L5) to trigger the scope.
7. Select Y RF with the WFM SELECT on pull out drawer.
8. Loosen the 2 screws (A) a 1/4 of a turn and insert the eccentric screwdriver into hole (B) as shown in figure 2–14–2.
9. Adjust the A/C Head assembly by turning the eccentric screw driver to make the envelope level maximum, and the skip portion in the same position as shown in figure 2–14–1.
10. Tighten the 2 screws (A).

Note:
After this adjustment, confirm the envelope output, height, and azimuth adjustment of the A/C head.

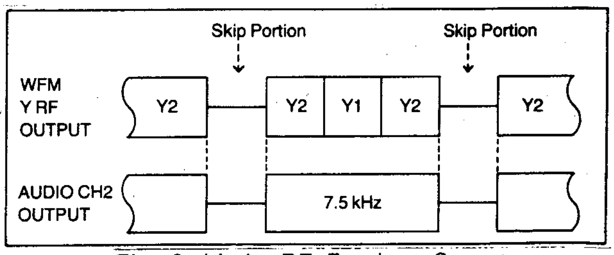


Fig. 2–14–1 RF Envelope Output

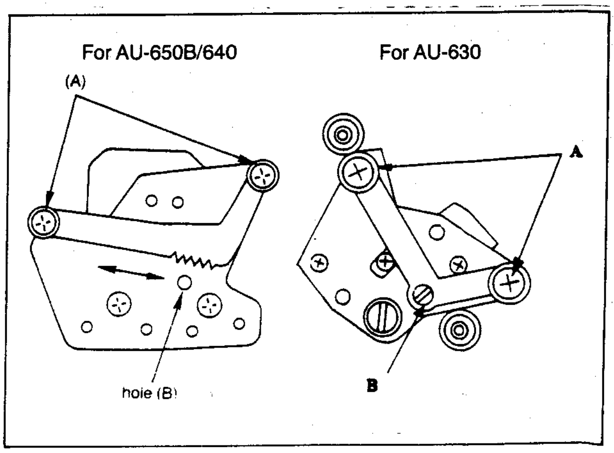


Fig. 2–14–2 Adj. Horizontal A/C Head

2-15. BRAKE SOLENOID REPLACEMENT AND ADJUSTMENT

2-15-1. Replacement

Removal

1. Remove the bottom plate.
2. Disconnect connectors P428 and P429 on the Mechanical Intermediate (2) P.C.Board.
3. Remove the 4 screws (A) and the supply and take up brake cover plates.
4. Remove the 4 screws (B) and remove the supply and take up solenoids.

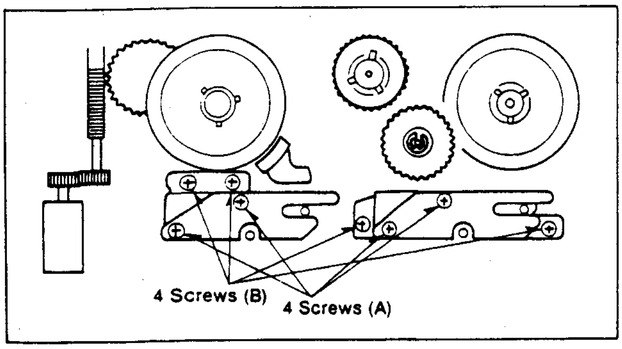


Fig. 2-15-1 Main Brake

Installation

1. Follow the removal steps in inverse order.

2-15-2. Adjustment

Tools Required
Eccentric Screwdriver (VFK0358) (VFK0359)

1. While moving the spring pin in each brake solenoid plunger in directions E and F, (figure 2-15-2) observe the clearance (A) and (B) between each brake pad and it's turntable. This clearance should be between 0.8 and 1.2mm.
2. If not, loosen the 2 screws (D) and insert the eccentric screwdriver in hole (C).
3. Adjust the position of the main brake so that the clearance (A) and (B) is within specifications. (figure 2-15-2)

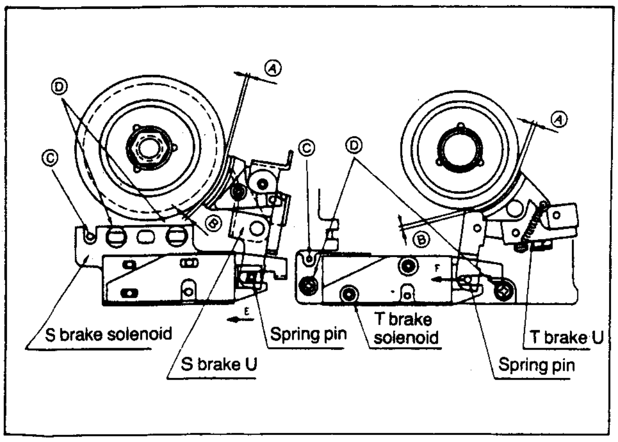


Fig. 2-15-2 Main Brake

4. Observe the clearance (A) as shown in (figure 2-15-3) and make sure that it is within 0.8 to 1.2mm.
5. If not, loosen the two screws (C) and insert the eccentric screwdriver into hole (B). Adjust the brake stopper so that clearance (A) is within specifications. (figure 2-15-3)
6. Tighten the two screws (C).

Note:
After this adjustment, rotate the take up reel counterclockwise, and the supply reel clockwise and verify that the clearance (H) is 0.3 to 0.7mm as shown in figure 2-15-3. (While brake is engaged).

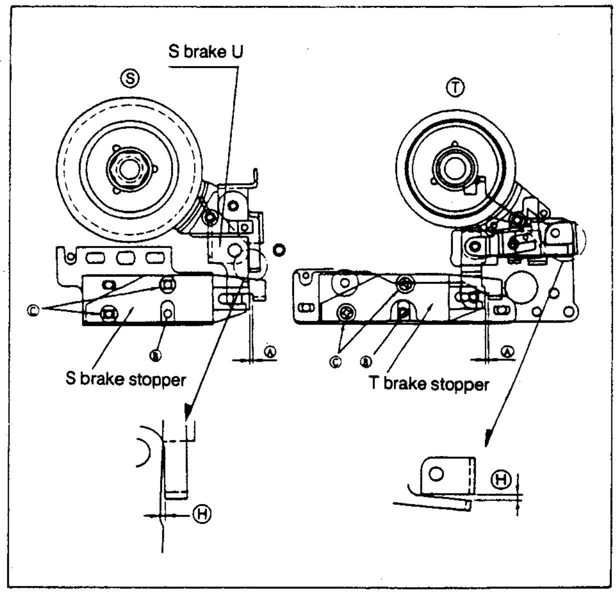


Fig. 2-15-3 Brake Solenoid

2-16. DRUM UNIT REPLACEMENT AND ADJUSTMENT

2-16-1. Replacement

Removal

1. Disconnect the connectors (A), (B), (C) and (D) as shown in figure 2-16-1.

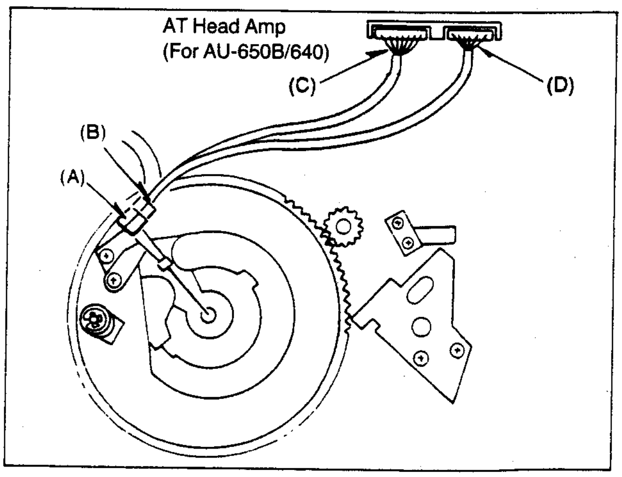


Fig. 2-16-1 Drum's Connectors (1)

2. Remove the bottom plate.
3. Disconnect the 2 connectors (E) as shown in figure 2–16–2 for AU–650B/640 or figure 2–16–3 for AU–630.
4. Remove the top cover of the shield case (R/P Head Amp) and disconnect the 2 connectors (G) as shown in figure 2–16–2 or figure 2–16–3.
5. Disconnect the connector (H).
6. Remove the 3 screws (F) and remove the drum assembly from the tape transport side.

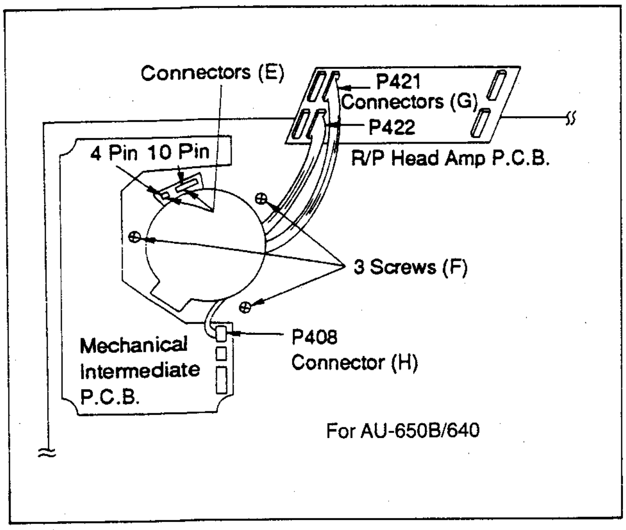


Fig. 2–16–2 Drum Unit for AU–650B/640

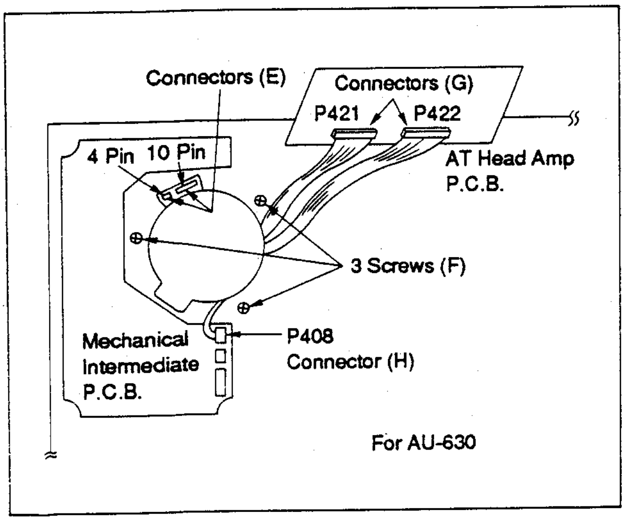


Fig. 2–16–3 Drum Unit for AU–630

Installation

1. Install new head drum assembly.
(Do not touch the surface of the head drum where tape contacts)
2. Tighten the 3 screws (F) evenly.
(recommended driver torque ––– 8 kg/cm)
3. Reconnect the connectors that were disconnected during the removal.
4. Clean the head drum.

2–16–2. Adjustment

1. Make checkings and adjustments according to the following flow chart.

No.	ITEM (PAGE)		ADJUSTMENT NAME
	AU-650B/640	AU-630	
1	2-9 (3-5)	2-8 (3-9)	Drum Reference Voltage Adjustment
2	2-13 (2-14)	2-12 (2-10)	Linearity Adjustment
3	2-31 (2-31)	2-30 (2-29)	Tape Tension Adjustment
4	2-20 (3-7)	2-20 (3-16)	PG Shifter Adjustment
5	2-21 (3-8)	——	Rec Shifter Adjustment
6	2-13-2 (2-14)	2-12-2 (2-11)	A/C Head Height Adjustment
7	2-13-2 (2-14)	2-12-2 (2-11)	Linearity Adjustment
8	2-13-2 (2-14)	2-14-1 (2-21)	Audio Head Azimuth Adjustment
9	2-15 (2-23)	2-14-1 (2-21)	Horizontal Position of A/C HEAD Adjustment
10	2-15 (2-23)	2-20 (3-16)	PG Shifter Adjustment
11	2-20 (3-7)	——	Rec Shifter Adjustment

2–17. LOADING MOTOR REPLACEMENT AND ADJUSTMENT

2–17–1. Replacement

Removal

1. Remove the bottom plate.
2. Disconnect the connector P439 on the Mechanical Intermediate (1) P.C.Board.
3. Remove the 3 screws (A) and remove the turn roller lifter unit (B) as shown in figure 2–17–1.
4. Remove the 3 screws (C) and remove the switch (D).
5. Remove the 4 screws (E), motor holder cover (G) and the loading motor unit (F).
6. Remove the loading belt (H).
7. Remove the hex screw (I) and remove the motor pulley (J).
8. Remove the screw (K) and remove the loading motor.

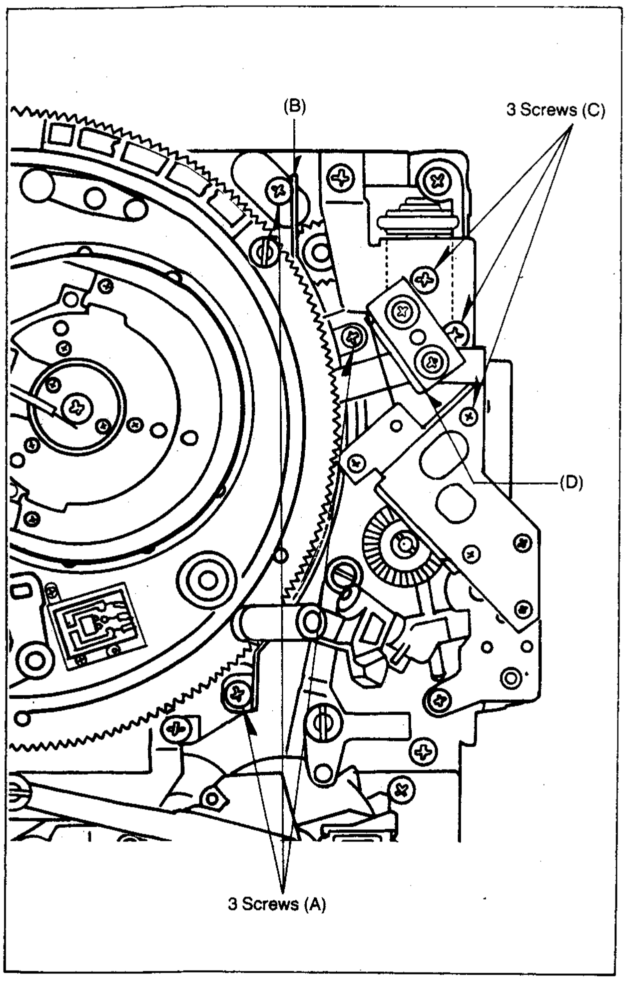


Fig. 2–17–1 Loading Motor Unit

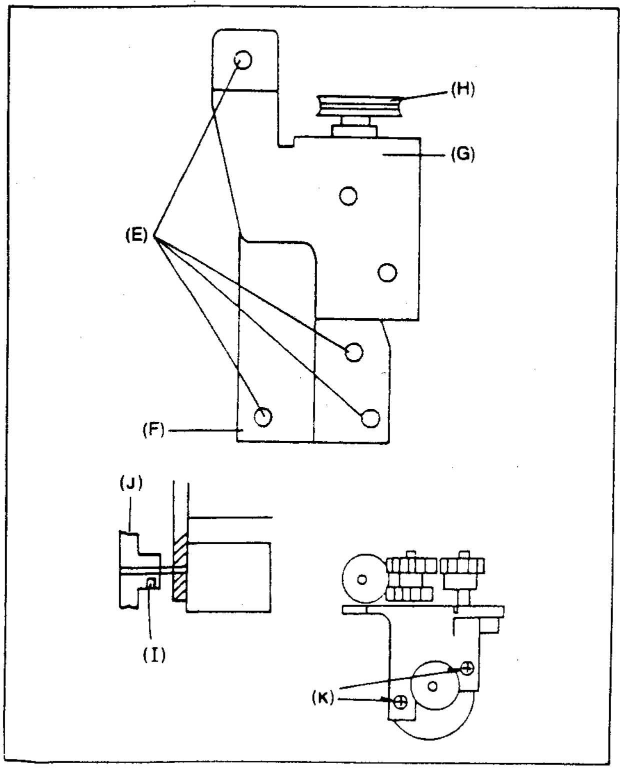


Fig. 2–17–2 Loading Motor

Installation

1. Follow the removal steps in inverse order

2–18. FRONT LOADING MOTOR REPLACEMENT

Removal

1. Remove the front loading unit.
2. Unsolder the 2 leads on the front loading motor.
3. Remove the front loading belt.
4. Remove the 2 screws (A) and remove the front loading motor.

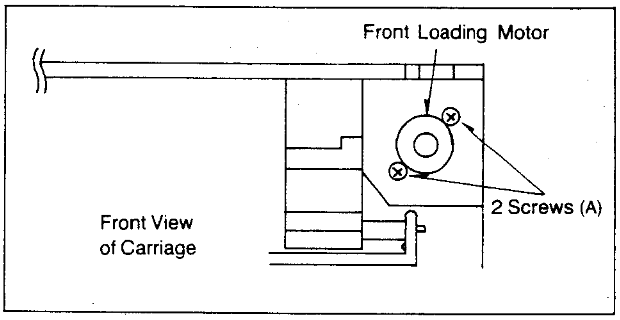


Fig. 2–18–1 Front Loading Motor (I)

Installation

1. Install new front loading Motor by reversing steps above.

2–19. SMALL CASSETTE LOADING MOTOR REPLACEMENT

1. Remove the front loading unit.
2. Loosen the hex screw and remove the supply reel table as shown in figure 2–19–1.
3. Unscrew the 2 screws (B) and remove the loading motor unit in direction as shown in figure 2–19–1.

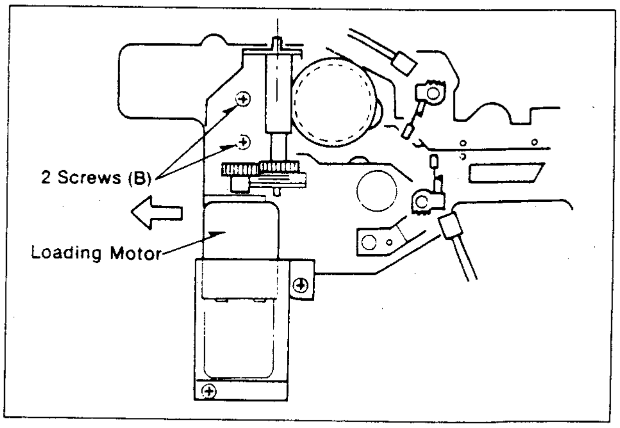


Fig. 2–19–1 Loading Motor Unit

4. Unsolder the 2 wires on the loading motor.
5. Unscrew the 2 screws (C) and remove the loading motor as shown in figure 2-19-2.

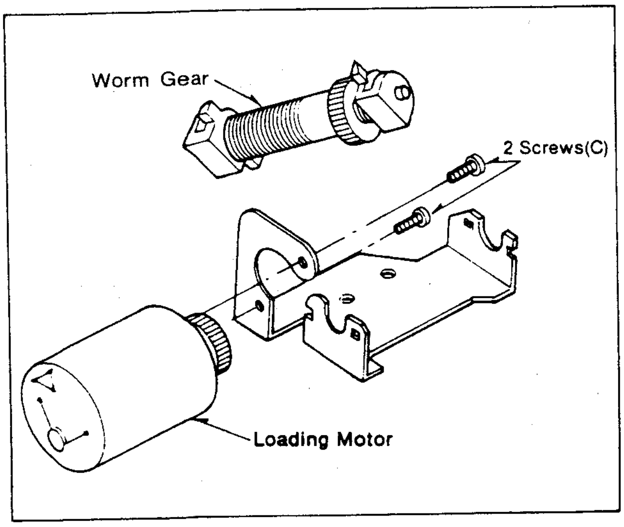


Fig. 2-19-2 Loading Motor

Installation

1. Install the new loading motor and set the triangular mark of loading motor to the upper side (away from the main bracket).
2. Tighten the 2 screws and follow the removal instructions in inverse order.

2-20. LEAF SWITCH REPLACEMENT AND ADJUSTMENT

2-20-1. Replacement

Removal

1. Remove the front loading unit.
2. Loosen the hex screw and remove the supply reel table as shown in figure 2-7-2.
3. Unsolder the wire (A) on the leaf switch.
4. Unscrew the screws (B) and remove the leaf switch as shown in figure 2-20-1.

Note:
Both leaf switches use the same replacement procedure.

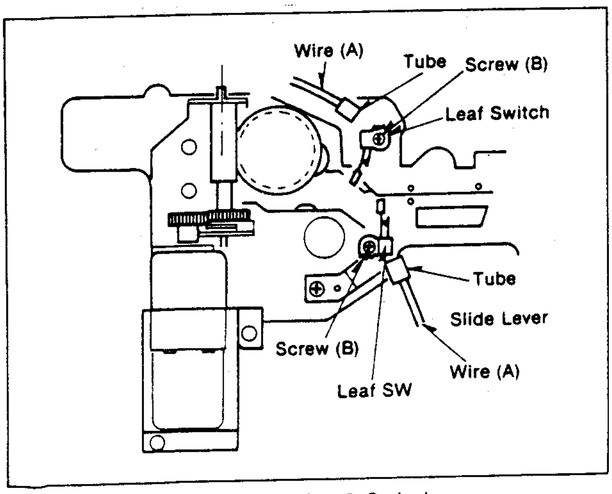


Fig. 2-20-1 Leaf Switch

Installation

1. Install the new leaf switch and solder the wires. Cover the exposed ends with shrink tubing.
2. Follow the removal steps in inverse order.

2-20-2. Adjustment

* Tools Required:
Fine Adjustment Screwdriver (VFK0446)

1. After remove the front loading unit reconnect the connector (P406) to the removed front loading unit . Insert a work small cassette to the removed front loading unit to make small cassette mode.
2. Confirm that the projecting part 3 (figure 2-20-2) on the white plastic slide lever is in line with it's corresponding hole 2 as shown in figure 2-20-2.
3. If it is not, turn the power switch off and loosen the hex screw on the supply reel table, and remove the supply reel table. Loosen screws (B), and insert the fine adjustment screwdriver into hole (C).
4. Adjust the reel table up leaf switch position, by turning the fine adjustment screw driver power switch ON and confirm that the projecting part on the slide lever is lined up with the hole 2 as shown in figure 2-20-2.
5. If it is not. Repeat steps 3 and 4.
6. Place the unit in the large cassette mode by dummy plug switch.
7. Confirm that the position of the projecting part 3 on the slide lever is aligned with hole.
8. If not, power switch off and loosen screw (E), then insert the fine adjustment screwdriver into hole (F).
9. Adjust the leaf switch (down) until alignment of projecting part 3 and hole 1 is achieved as same as steps 3 and 4.

Note:
Confirm that the two gears (interlocking gear and small cassette reel gear) fit properly, when the small cassette reel table is raised. (see figure 2-20-2)

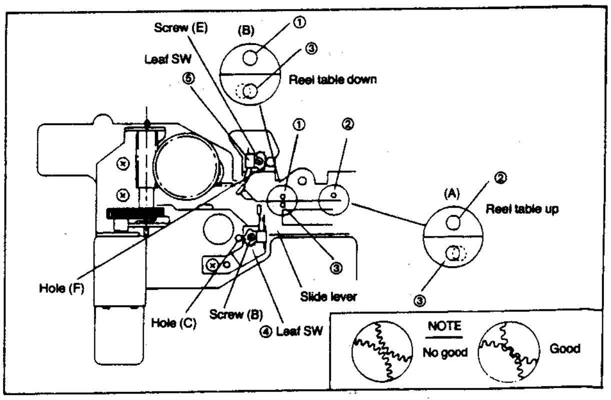


Fig. 2-20-2 Slide Lever

2–21. INTERMEDIATE GEAR REPLACEMENT

Removal

1. Remove the front loading unit.
2. Turn the loading motor for the small cassette by hand until the intermediate gear is disengaged from the small reel table as shown in figure 2–21–1.
3. Remove the E–ring (A) and remove the intermediate gear.

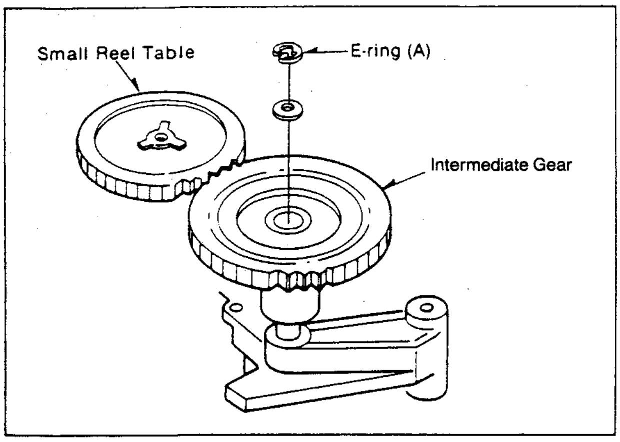


Fig. 2–21–1 Intermediate Gear

Note:
Be sure not to lose the washers.

Installation

1. Install the new intermediate gear and follow the removal steps in inverse order.

2–22. DETECTOR BASE UNIT REPLACEMENT

Removal

1. Remove the front loading unit.
2. Remove the screws (A) and remove the Detector Base Unit.
3. Unsolder the 3 wires (B).

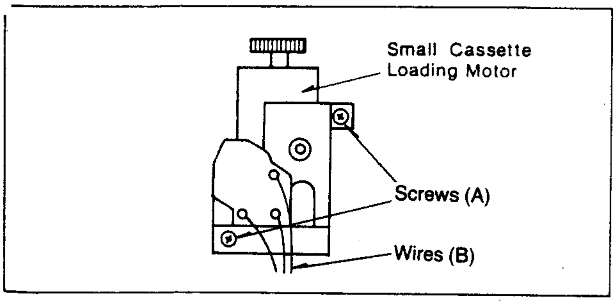


Fig. 2–22–1 Detector Base Unit

Installation

1. Install the new Detector base unit following removal steps in inverse order.
2. Confirm that both sizes of cassette are detected properly and that the correct reel tables actuate.

2–23. CASSETTE PROP HEIGHT ADJUSTMENT

Tools Required
Mechanical Neutral Adjustment Plate (VFK0352)
Hex Wrench (1.5mm)

1. Remove the front loading unit.
2. Loosen the 10 hex screws as shown below.

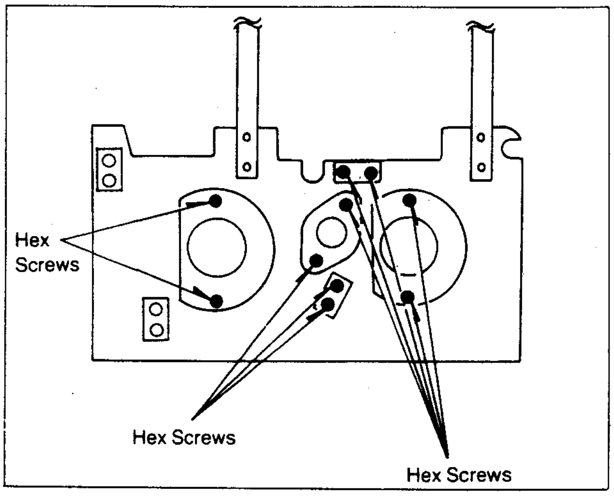


Fig. 2–23–1 Mechanical Neutral Plate

3. Slightly loosen the hex screw (A) on the large cassette prop. (This screw is located in front of the take–up reel, right hand side of the Take–up brake solenoid.) (Shown in figure 2–23–3)
4. Set the Mechanical Neutral Adjustment plate on the reel tables, and press the left side of the neutral adjustment plate (middle of the reference props A, B and D) with your finger.
5. Position the adjustment prop so that it just touches the Mechanical Neutral Adjustment plate and then tighten hex screw (A). (figure 2–23–3)

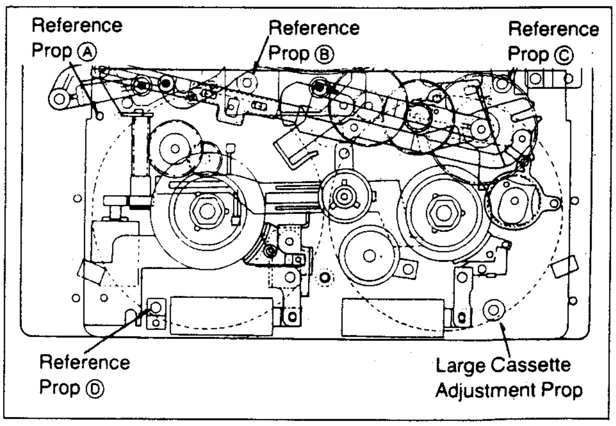


Fig. 2–23–2 Prop position

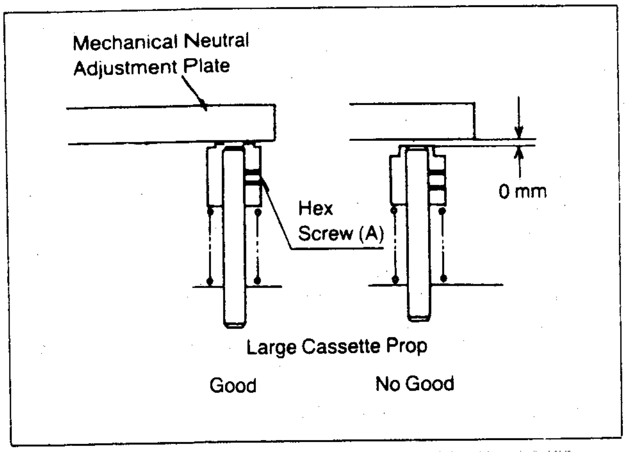


Fig. 2-23-3 Small and Large Cassette PROP

2-24. SMALL CASSETTE PROPS HEIGHT ADJUSTMENT

Tools Required
Mechanical Neutral Adjustment Plate (VFK0352)
Hex Wrench (1.27, 1.5mm)

1. Remove the front loading unit.
2. Loosen the 10 hex screws as shown in figure 2-23-1. Place the Mechanical Neutral Adjustment plate over the reel tables.
3. Loosen the hex screw (B) on each post and set the height of each cassette holder until it touches the bottom of the Mechanical Neutral Adjustment Plate. (figure 2-25-3)

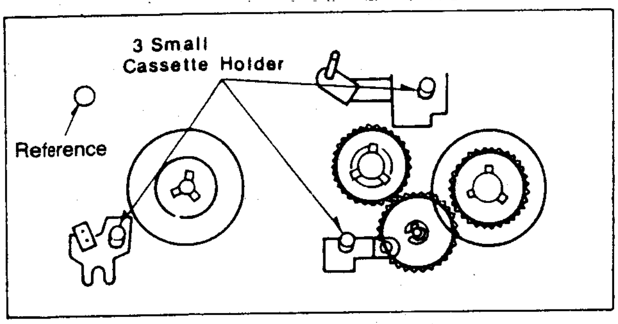


Fig. 2-24-1 Small Cassette Holder Position

2-25. SMALL CASSETTE REEL TABLE HEIGHT ADJUSTMENT

Tools Required:
Mechanical Neutral Adjustment Plate (VFK0352)
Hex Wrench (1.27mm)

1. Remove the front loading unit.
2. Remove the E ring and Loosen the hex screw (A) as shown in figure 2-25-1.
3. Remove the intermediate gear with the take up reel table.

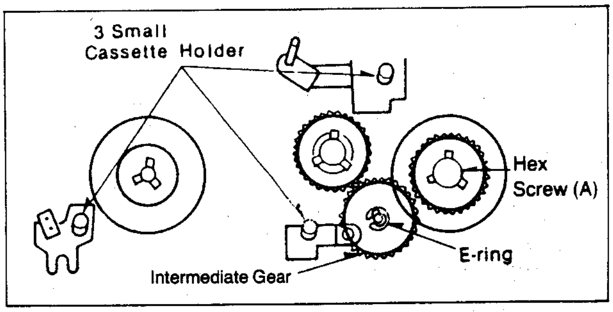


Fig. 2-25-1 Intermediate Gear

4. Unscrew the 2 hex screws (C) on the mechanical Neutral adjustment plate and remove the take up reel adjustment plate as shown in figure 2-25-2.

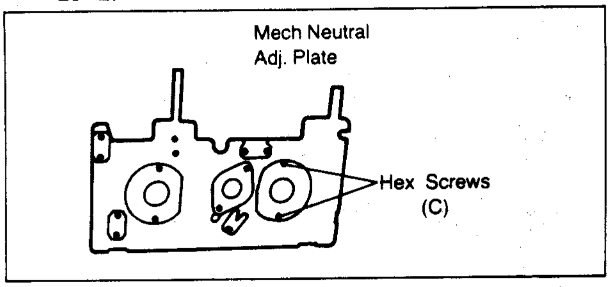


Fig. 2-25-2 Mech Neutral Adj. Plate

5. Loosen the hex screw (B) and set the Mechanical neutral adjustment Plate over the reel tables. (figure 2-25-3)

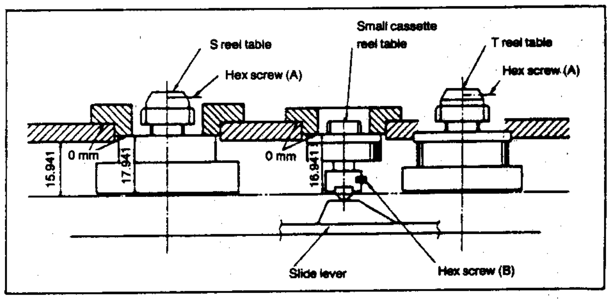


Fig. 2-25-3 Reel Table

6. With your finger, raise the small cassette reel tables until it touches the bottom of the Mechanical Neutral Adjustment Plate.
7. Remove the Mechanical Neutral Adjustment Plate carefully, so as not to touch or move the small cassette reel table, Then tighten hex screw (B).
8. Replace the intermediate gear and the take up reel table.
9. Perform the take up reel table height adjustment. (Refer to section 2-7-2.)

2-26. RING ROLLER ADJUSTMENT

1. With the power switch off (with out a cassette), press the loading control gear down. (To free the loading ring). Turn the loading ring counterclockwise approximately 20 degrees.
2. Move the loading ring back and forth by hand as indicated by the arrows X-X' in figure 2-26-1 Confirm that the loading ring's free movement is approximately 0.3mm.
3. Loading ring play is adjusted by loosening the 2 screws (A) and moving the ring roller unit in the direction indicated by arrows Y-Y' in figure 2-26-1. Adjust for 0.3mm of free movement.
4. Tighten the 2 screws (A).
5. Confirm that the loading ring turns smoothly.
6. Reset the loading control gear.

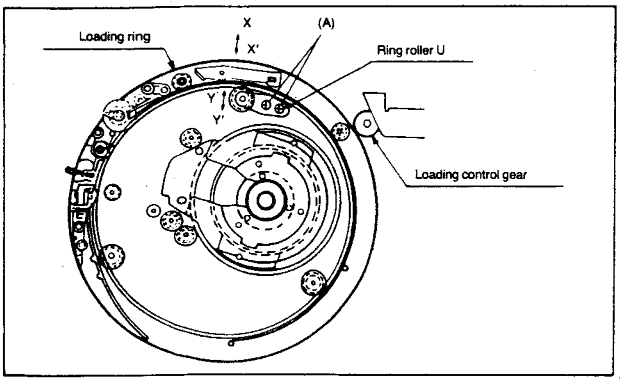


Fig. 2-26-1 Ring Roller

2-27. LOADING COMPLETION DETECT PHOTO SENSOR POSITION ADJUSTMENT

* Tool Required:
Fine Adjustment Screwdriver (VFK0446)
* Specification 0-1mm

1. Move the stopper lever (figure 2-27-1) toward the photo sensor by hand and verify that the distance (A) is within 0-1mm.
2. If not, loosen the 2 screws (C) and insert the fine adjustment screwdriver into hole (D).
3. Adjust the loading completion detect photo assembly by moving it forward, or backward as indicated by the arrows X-Y in figure 2-27-1 so that distance (A) is 0 to 1mm.
4. Tighten the 2 screws (C).
5. After this adjustment, confirm that the photo sensor output level is more then 4.5V at loading completion and less than 0.5 volt at unloading completion. This voltage is measured at TP5 on the System Control board.

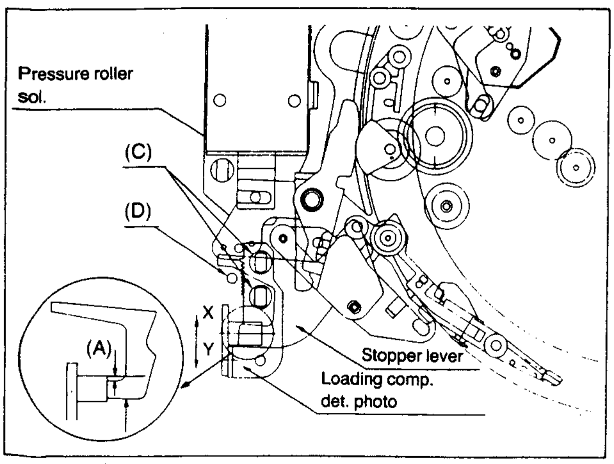


Fig. 2-27-1 Loading Completion Sensor

2-28. UNLOADING COMPLETION DETECT PHOTO SENSOR POSITION ADJUSTMENT

* Tool Required:
Fine Adjustment Screwdriver (VFK0446)
* Specification 1-2mm

1. With the power off (without a cassette), measure the clearance (A) as in indicated in figure 2-28-1. This distance should be from 1mm to 2mm.
2. If not, loosen the 2 screws (C) and insert the fine adjustment screwdriver into hole (D). (figure 2-28-1)
3. Adjust the unloading completion detect photo sensor so that the clearance (A) is from 1mm to 2mm.
4. Tighten the 2 screws (C).
5. After this adjustment, confirm that the photo sensor output is more than 4.5V DC in the unloading completion mode. At loading completion this voltage should be less than 0.5V DC. This measurement point is TP5 on the System Control board.

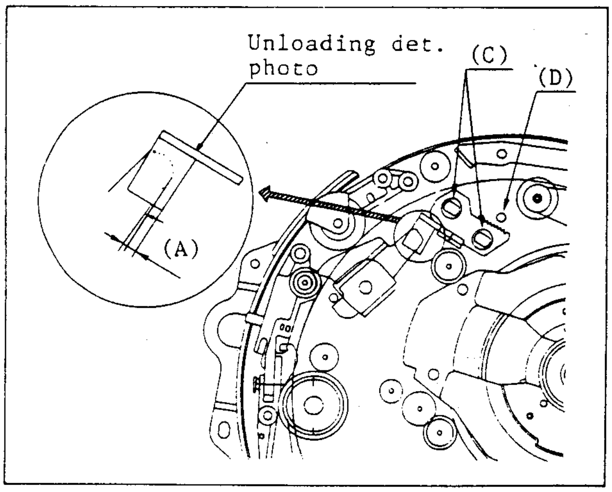


Fig. 2-28-1 Unloading Completion Sensor

2-29. POSITION OF P1 POST DRIVE ROD

* Tools Required:
Eccentric Screwdriver (VFK0358)

1. Remove the front loading unit.
2. Remove the 3 screws (D) on the small cassette holder unit and remove the small cassette holder. (figure 2-29-1)

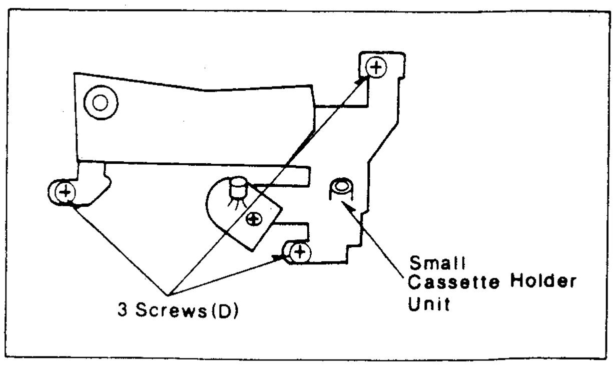


Fig. 2-29-1 Small Cassette Holder Unit

3. Remove the front loading unit from the unit, reconnect the connector (P406) to the removed front loading unit. Insert a work cassette to the removed carriage and press the EJECT button.
4. Measure the distance (C) as shown in figure 2-29-2 and verify that it is within 0.5mm (+/- 0.1mm).
5. If not, loosen the two screws (A) (figure 2-29-2) and insert the eccentric screwdriver into hole (B). Adjust the P1 post drive rod length so that distance (C) becomes 0.5mm (+/- 0.1mm). Tighten the 2 screws (A) and replace the small cassette holder.

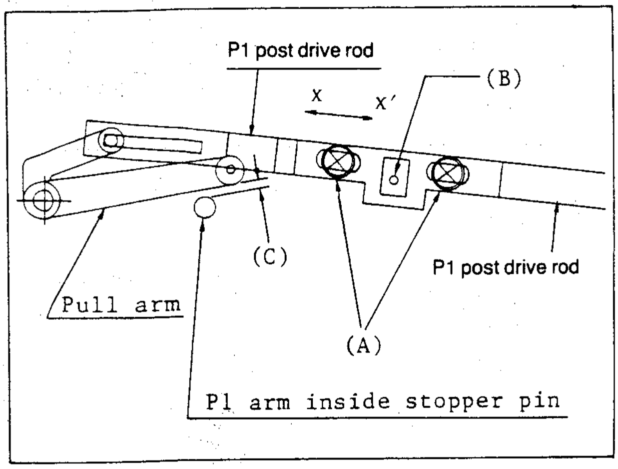


Fig. 2-29-2 P1 Post Drive Rod

2-30. TENSION REPLACEMENT AND ADJUSTMENT

Tools Required

Tentelometer (VFK0132)
Eccentric Screwdriver (VFK0357) (VFK0359)
Digital Voltmeter

2-30-1. Supply Tension Arm Unit Replacement

1. Loosen the hex screw (A) and remove the Supply Tension Unit as shown in figure 2-30-1.
2. Install the new Supply Tension Arm Unit.

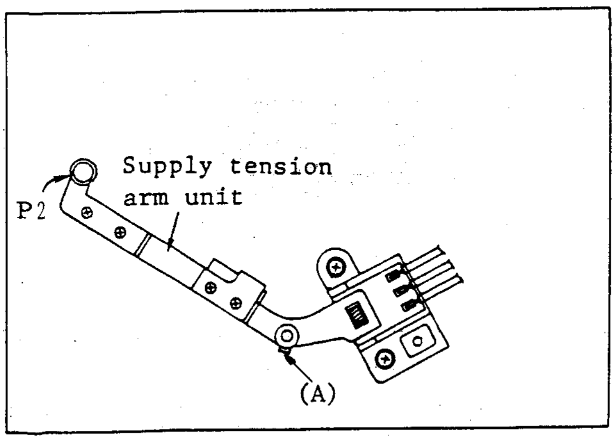


Fig. 2-30-1 Supply Tension (Eject Mode)

NOTE :
When install new Supply Tension Arm Unit, the tension pick-up post will go down, then push the tension pick-up post from the bottom side as shown in figure 2-30-2.

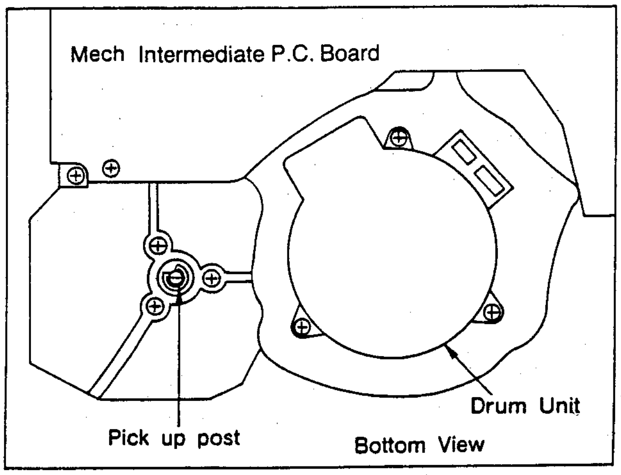


Fig. 2-30-2 Installation of S-Tension Arm Unit

2-30-2. Take-up Stopper Pin Base Unit Replacement

1. Remove the front loading unit.
2. Place the unit in the Loading mode (By manual) (Do not use a cassette)
3. Remove the screw (A) and Take-up Stopper Pin Base Unit as shown in figure 2-30-3.
4. Install the new Take-up Stopper Pin Base Unit.
5. After replaced it, adjust the position of the Take-up Stopper Pin Base Unit.

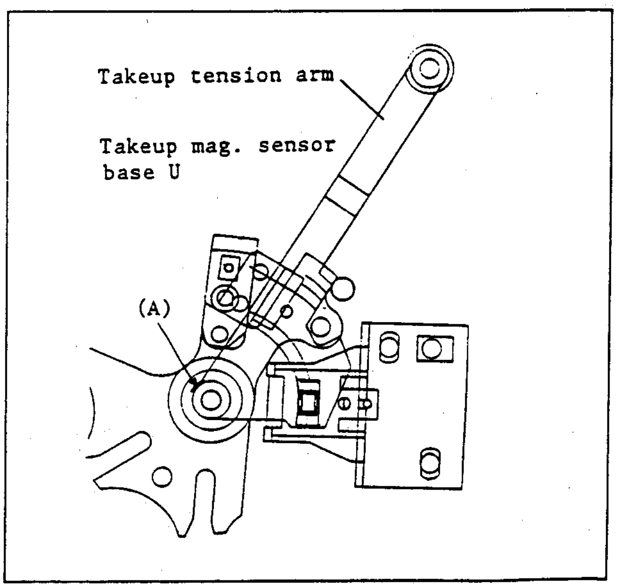


Fig. 2-30-3 Takeup Tension (W/Tape)

2-30-3. S and T Tension Magnet Adjustment

* Tools Required :
Dummy Plug (1) (VFK0361)

1. Turn the Power off.
2. Remove the Front Loading unit and connect the dummy plug (1) into P406.
3. Turn the Power ON.
4. Press the stop button to load the tape.
5. Check to see, observe the clearance (A) and (B) between each magnet and sensor.
   This clearance should be between 0.5 +/− 0.1mm. (figure 2−30−4)
6. If not, loosen the hex screw (C) and adjust the position of the magnet so that the clearance (A) and (B) is within specifications. (figure 2−30−4)
7. Tighten the hex screws.

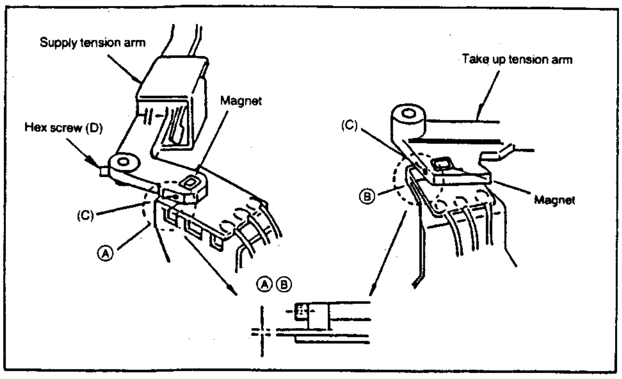


Fig. 2−30−4 S and T Tension magnet

2−30−4. Tension Adjustment

* Tools Required :
Tentelometer (VFK0132)
Eccentric Screwdrivers (VFK0357) (VFK0359)
Digital Voltmeter
Dummy Plug 1 (VFK0361)

NOTE : This adjustment showld be performed after adjusting the "REFERENCE LEVEL ADJUSTMENT."
(Electrical Adjustment Procedures 2−3.)

1. Remove the front loading unit and connect the dummy plug (1) into P406 socket.
2. Extend the servo board and turn power on.
3. Place the unit in the eject mode and connect a digital voltmeter to TP82.
   Adjust VR41 (TENSION SENSOR AMP) for 2.5+/−0.002 (V).
   Connect the digital voltmeter to TP83, and adjust VR42 (TENSION SENSOR AMP) for 2.5+/−0.002 (V/DC).
4. Set the mechanical neutral adjustment plate over the reel tables and fix the plate as shown in figure 2−30−5.

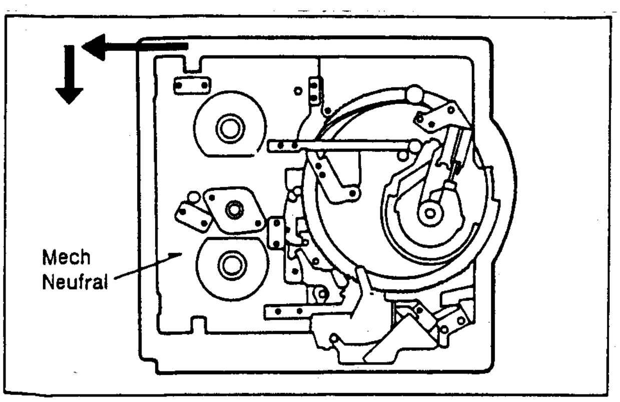


Fig. 2−30−5 Mecha Neutral

5. Measure and record the sensor voltage at TP82 (Vs) and TP83 (Vt).

Note:
Vs: Supply Reel Sensor Voltage
Vt: Takeup Reel Sensor Voltage

6. Place the unit in the STOP mode.
   After loading is completed make sure that the P2 post touches the arm of the mechanical neutral adjustment plate as shown in figure 2−30−6.
7. Measure the voltage at TP82 and TP83, and verify that it is the same as Vs and Vt measured in step 5.
8. If it is not, loosen the 2 screws (A) and insert the eccentric screwdriver into hole (B) and adjust the supply magnet sensor base unit, until the voltage at TP82 equals VS (+/− 0.005V), TP82 equals VS (+/− 0.005V) (figure 2−12−6, 2−30−7).

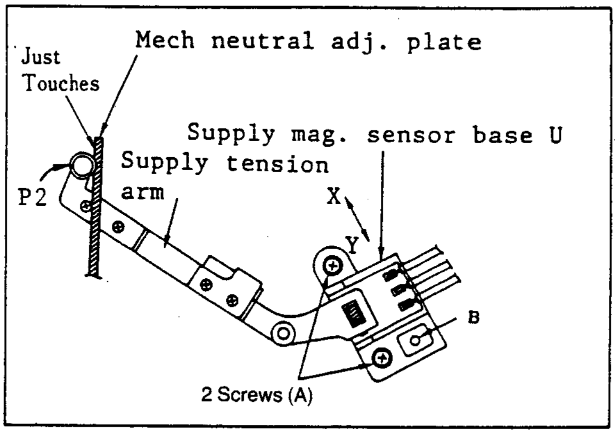


Fig. 2−30−6 Supply Tension

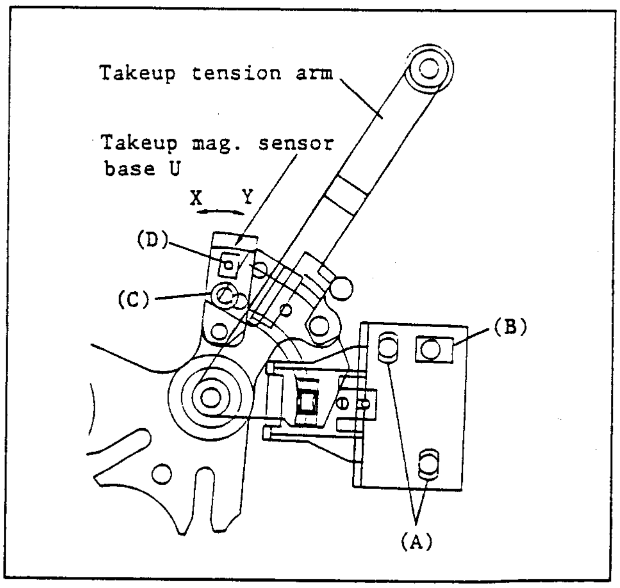


Fig. 2−30−7 Take up Tension

9. Tighten the 2 screws A (make sure the voltage at TP82 and TP83 does not change) and remove the mechanical neutral adjustment plate.
10. After this adjustment, confirm that the voltage at TP82 will change by more than 100mV, as the P2 post is moved by hand.
11. Connect the jumper wires between TP86, TP88 and TP85 to defeat the tape slack.
12. Connect the digital voltmeter to TP78.
13. Place the unit in the play mode and adjust VR29 so that the voltage at TP78 is the same as Vs (+/− 0.002V) as measured in step 5.

14. Place the unit in the SLOW X1, SLOW X−1 mode and adjust VR33, VR28 and VR27 so that the voltage at TP78, TP79 is follows.
SLOW X1 mode TP78 Vs +/− 0.002 (V) (VR33)
TP79 Vt +/− 0.002 (V) (VR28)
SLOW X−1 mode TP79 Vt +/− 0.002 (V) (VR27)

15. Place the cassette over the reel tables and place the weight on the cassette to hold it in place. (full roll of solder)
16. Place the unit in the play mode and confirm that the tape tension between P1 and P2 post is 23 grams (+2/−3 grams) as shown in figure 2−30−8. (Tape tension confirmation should be done after stabilized the tape movement.)

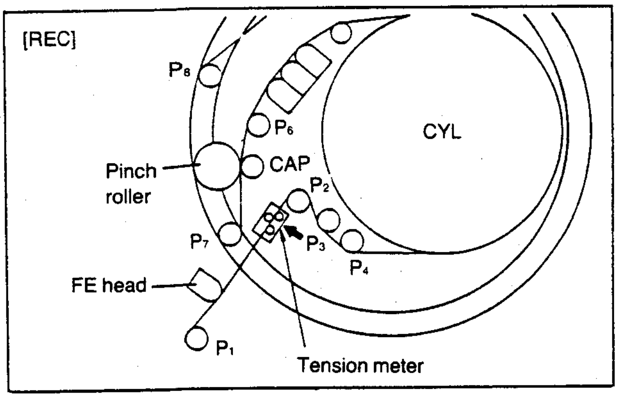


FIg. 2−30−8 Supply Tension

17. If the tension meter reading is not 23 grams (+2/−3 grams), loosen screw (A), and insert the eccentric screwdriver into hole (B) and adjust the tension as shown in figure 2−30−9.

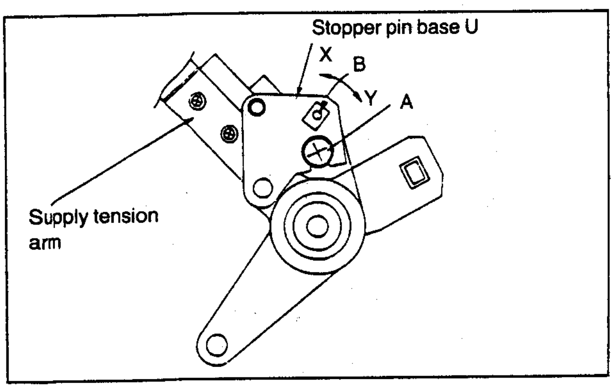


Fig. 2−30−9 Supply Tension Adjustment

18. Tighten screw A.
19. Play back the work cassette from its beginning and adjust VR39 for 0.28V (+/−0.002V) at TP94.
20. Connect the jumper wires between TP97 and TP79.
21. Place the unit in the SLOW (X1) mode and adjust VR40 so that the take up tension is 15 grams (+/−2 grams) as shown in figure 2−30−10.

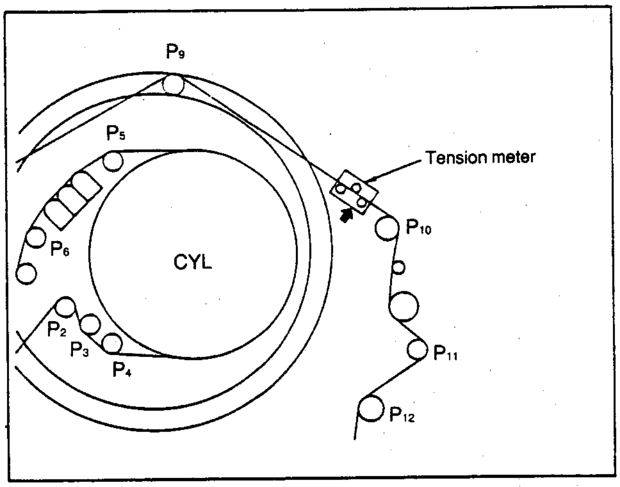


Fig. 2−30−10 Take up Tension

22. Remove the jumper wires.
23. Place, the unit in the FAST FORWARD mode from tape beginning and adjust VR32 so that the supply side tension is 8 grams (+/− 4 grams) between P1 and P2 post.
24. Place the unit in the REWIND mode from tape ending and adjust VR25 so that the take up side tension is 50 grams (+/−10 grams) between P9 and P10 post.

Note:
when the take up side tension is adjusted in the REWIND mode, the tension meter is sett to opposite as shown in figure 2−30−11.

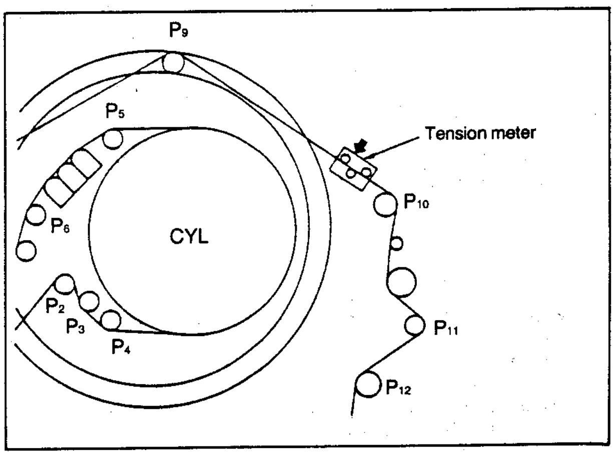


Fig. 3−30−11 Take up Tension (REW mode)

25. Confirm the Timer Roller phase in the FAST FORWARD mode. (Refer to page 2−10 Timer Roller position Adjustment)
26. Place the unit in the play mode without the tape.
27. Hold the supply tension arm by hand to stabilize the supply tension arm.
28. Measure and record the voltage at TP84(Es).
29. Hold the Take up tension arm by hand to stabilize the take up tension arm.
30. Measure and record the voltage at TP87(Et).
31. Remove the jumper wires between TP88, TP86 and TP85.
32. Place the unit in the STOP mode.
33. In the STOP mode, adjust VR36, VR37 so that the TP86, TP87 is follows.

TP86 (Es−1) +0.5/−0 (V) (VR36)
TP87 (Et−1) +0.5/−0 (V) (VR37)

Note:
If the (Es−1) or (Et−1) is less than 5V, Es or Et should be adjusted for (Es−0.3) or (Et−0.3) (V).

34. Remove the jumper wires between TP86, TP88 and TP85.

2−31. SMALL CASSETTE HOLDER SPRING ADJUSTEMNT

1. Remove the front loading unit and insert a small cassette all the way back.
2. Confirm that the Holder Spring (A) of the back side of front loading unit is into the hole (B) of the small cassette, as shown in figure 2−31−1.
3. If not, loosen screw (C) and adjust the position of the Holder Spring according to figure 2−31−1.

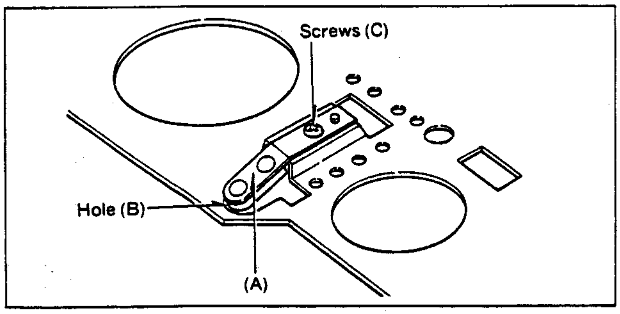


Fig. 2−31−1 Small Cassette Holder Spring

2−32 CASSETTE DETECT SENSOR ADJUSTMENT

* Tool Required :
  Fine Adjustment Screwdriver (VFK0446)

* Specifications

  A=0
  B=0.95 to 1.15mm

1. Remove the front loading unit and insert a cassette all the way back and hold it in place.
2. Slightly loosen the 2 screws (C).
3. Insert the fine adjustment screwdriver in the hole (D).
4. Adjust the position of the left side photo−sensor from the front so that clearance (A) is 0mm.
5. Adjust the position of the right side photo−sensor from the front so that the clearance (B) is 0.95 to 1.15mm.
6. Tighten the 2 screws (C).

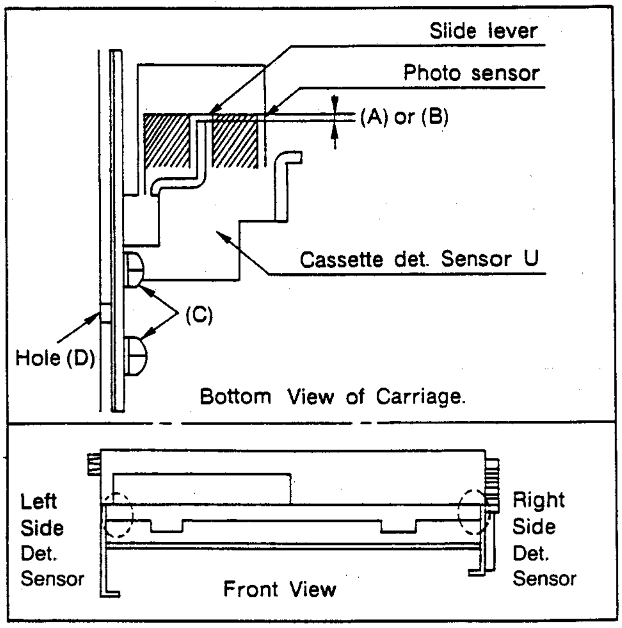


Fig. 2−32−1 Cassette Detect Sensor

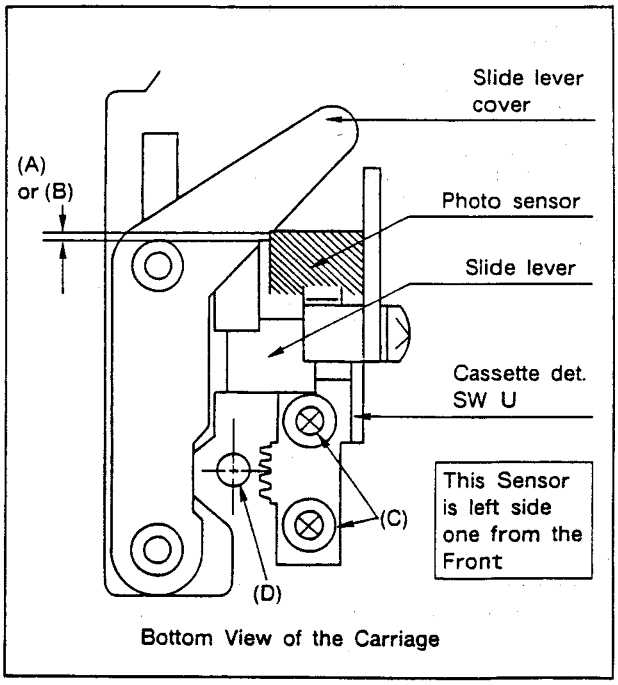


Fig. 2−32−2 Cassette Detect SW

2−33 CASSETTE LOADING AND EJECT COMPLETE SWITCHES ADJUSTMENT

1. Remove the front loading unit without removing the connector.
2. Insert a cassette into the front loading unit. When front loading is completed confirm that there is no clearance at the (E) position as shown in figure 2−33−2.
3. If it is not, loosen screw (A) and insert the fine adjustment screwdriver into hole (B).
4. Adjust the position of the switch (A) with the fine adjustment screwdriver so that the loading complete switch is on.
5. Tighten the screw (A) and reconfirm that there is no clearance at the (E) position.

6. Place the unit in the eject mode.
7. Slightly loosen the screw (C) and insert the fine adjustment screwdriver into hole (D).
8. Adjust the position of the switch (B), with the fine adjustment screwdriver, so that the Cassette Eject completion switch is on.
9. Then confirm that the drive pulley rotates 1/4–1/2 turn, smoothly by hand and there is no play on the mirror holder.
10. Tighten the screw (C).

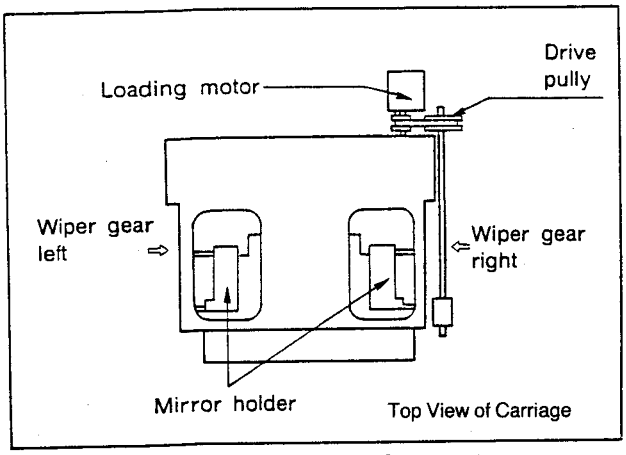


Fig. 2–33–1 Cassette Compartment

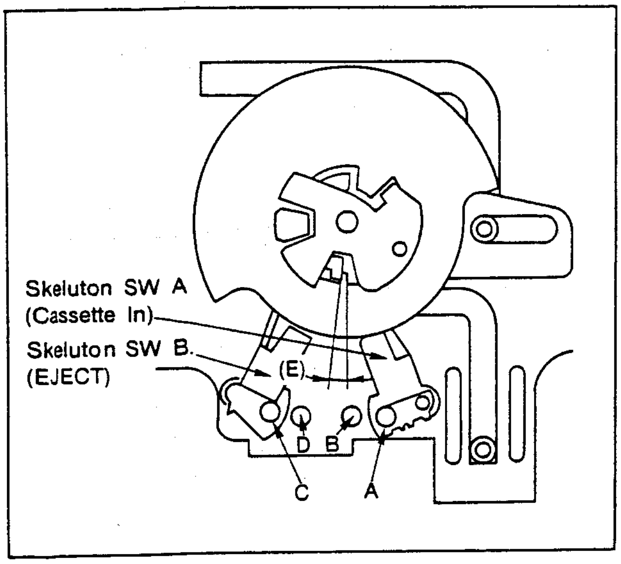


Fig. 2–33–2 Loading Cassette In SW

2–34 SMALL CASSETTE DETECT SW ADJUSTMENT

1. Remove the front loading unit, and insert a large cassette.

2. Confirm that the leaf switch at the back side of the front loading unit is on.

3. If it is not, slightly loosen the screw (A) and adjust the leaf switch so that it is on.

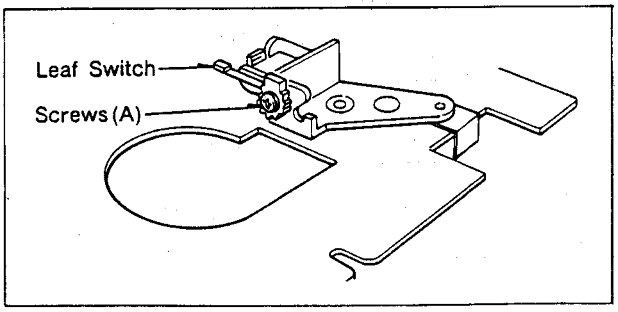


Fig. 2–34–1 Small Cassette Detect SW

2–35 FAN MOTOR REPLACEMENT

1. Remove the 2 screws (A) as shown in figure 2–35–1.

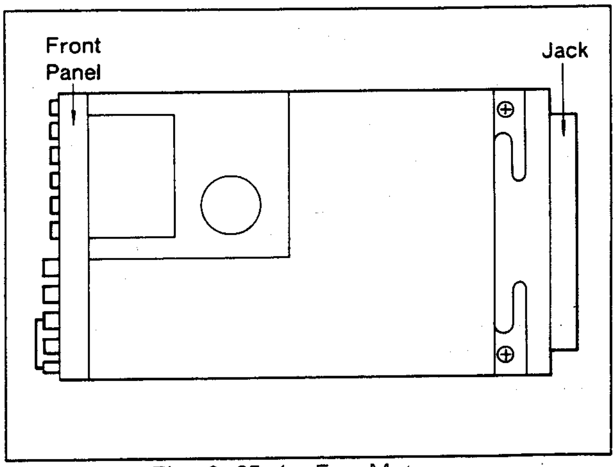


Fig. 2–35–1 Fan Motor

2. Remove the 8 screws (B) and disconnect the connector P332 and P333 on the Audio Main P.C.Board. as shown in figure 2–35–2.

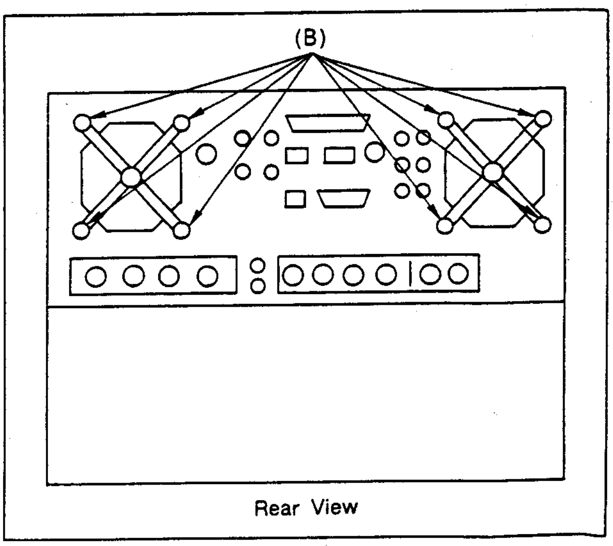


Fig. 2–35–2 Fan Motor Replacement

3. Remove the Fan Motor.

2-36. POWER BOX FAN MOTOR REPLACEMENT (For OLD TYPE)

1. Remove the 5 screws (A) and then open the Power Box as shown in figure 2-36-1.

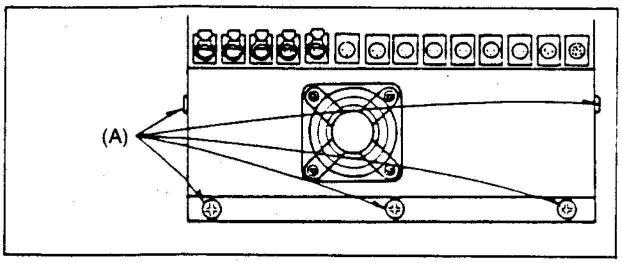


Fig. 2-36-1 Power Box Fan Motor

2. Disconnect the 7 connectors (P202,P210-P215) and remove the 6 screws (B) as shown in figure 2-36-2.

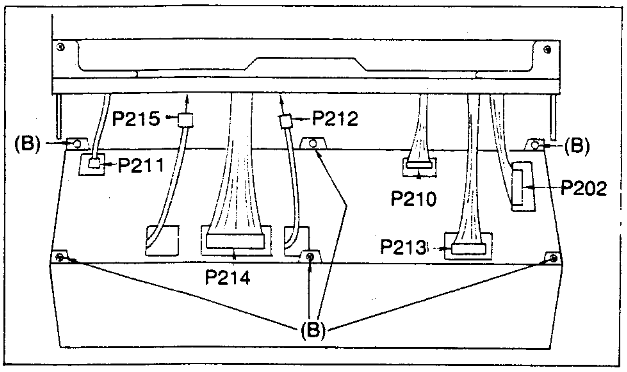


Fig. 2-36-2 Connector Removal

3. Remove the 4 screws (C) and 6 screws on the Power Box as shown in figure 2-36-3.

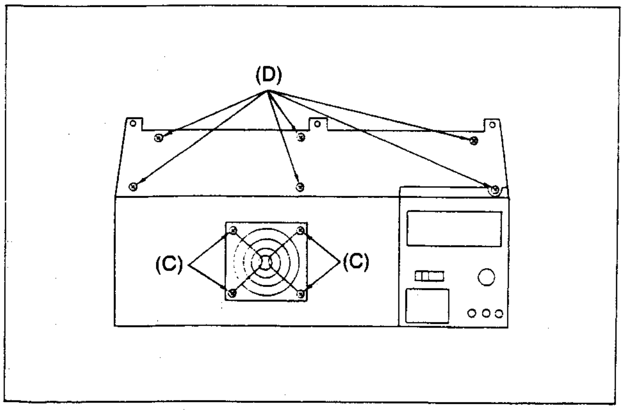


Fig. 2-36-3 Power Box

4. Pull out the SW Power 2 P.C.Board to the toward and unsolder the P216 as shown in figure 2-36-4.

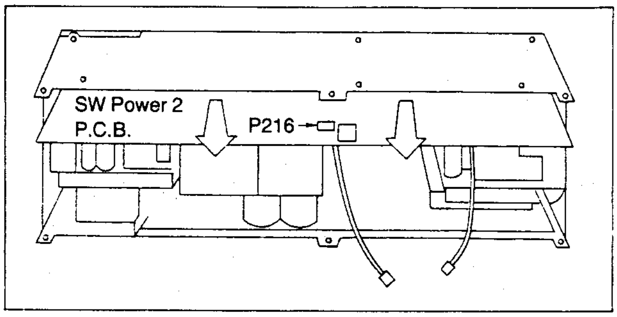


Fig. 2-36-4 SW Power 2 P.C.Board

2-37 POWER BOX FAN MOTOR REPLACEMENT (FOR NEW TYPE)

1. Remove the 5 screws (A) and then open the Power Box as shown in figure 2-36-1.
2. Disconnect the 7 connectors (P202, P210-P215) and remove the 6 screws (B) as shown in figure 2-36-2.
3. Cut the clamper (C) as shown in figure 2-37-1.

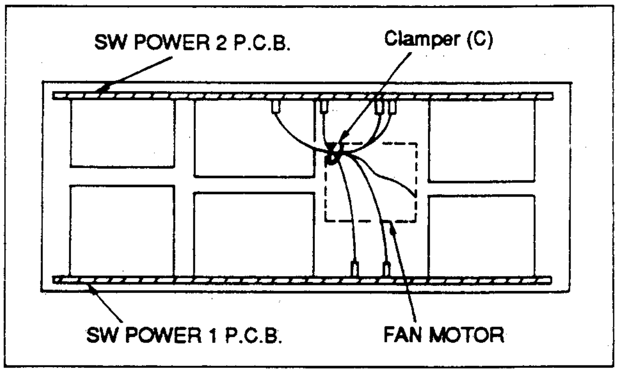


Fig. 2-37-1 POWER BOX

4. Disconnect the connector (P216) on the SW Power 2 P.C.B..
5. Remove the fan motor and install the new fan motor.

2–38 EJECT SW REPLACEMENT

1. Remove the 4 screws (A) as shown in figure 2–38–1.

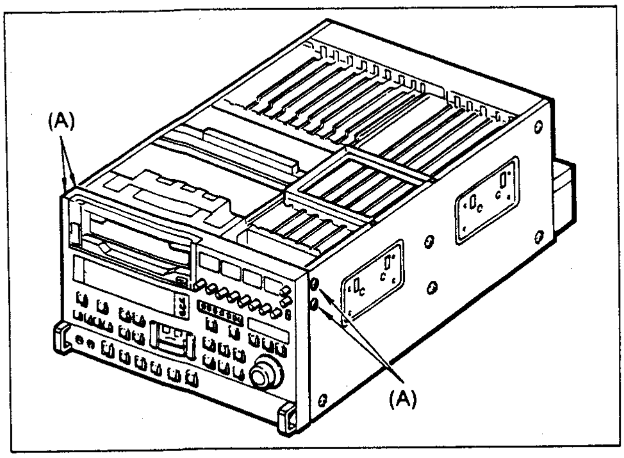


Fig. 2–38–1 Front Panel Removal

2. Remove the screw (B) on the Front Panel as shown in figure 2–38–2.

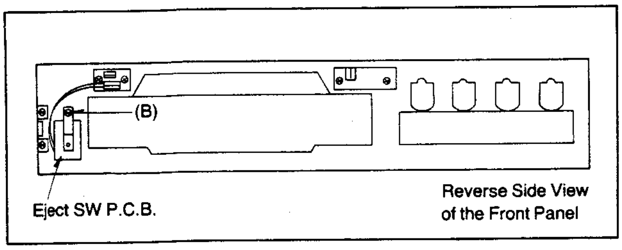


Fig. 2–38–2 Eject SW P.C.Board removal

3. Unsolder the Eject SW on the Eject SW P.C.Board as shown in figure 2–38–3.

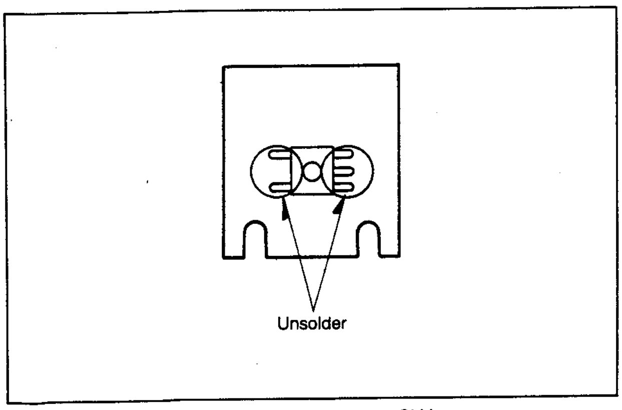


Fig. 2–38–3 Eject SW

Note:
When replacing the eject SW, be sure not to loose the spring.

Electrical Adjustment

Note :

1. The jumpers (shorting plugs) and selector switch are located on several circuit boards.
   The positions of the switches are shown in the operating instructions.
   These switches are used for adjustment purposes, therefore don't, change the position except during adjustment.
2. The position of the test points and adjustment points are shown in the electrical adjustment section.
3. Pre-heat unit over two hours before the electrical adjustment.
4. After servicing and adjustment, see to it that all parts such as insulation barriers, insulators, shields, jumper wires, and wiring harnesses are properly re-installed as originally found.

(C)

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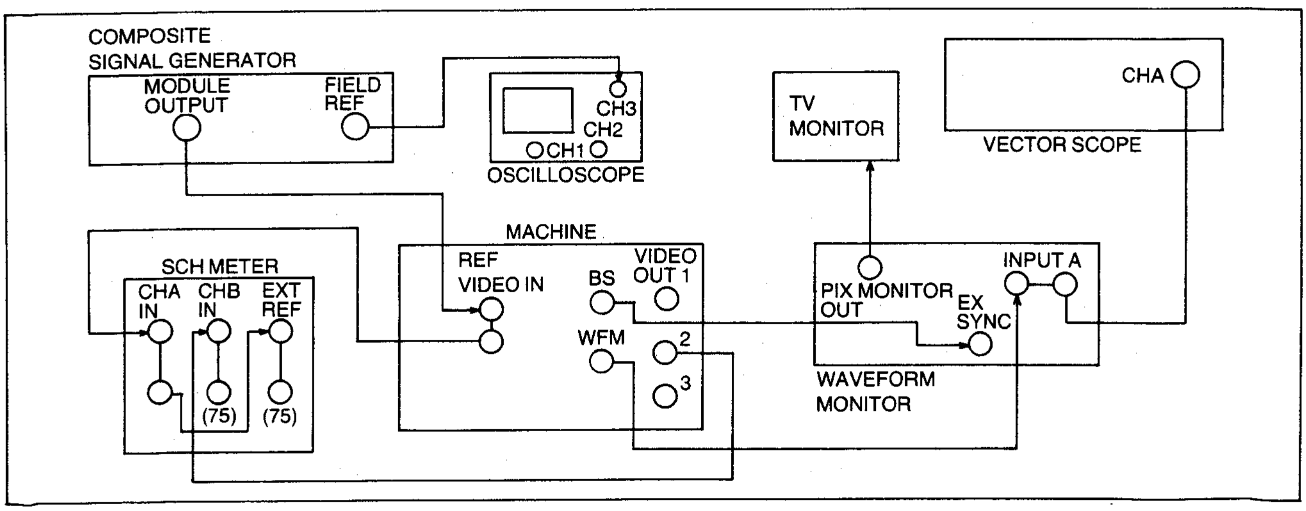
TEST AND SERVICE EQUIPMENT

To perform the electrical adjustment completely, following equipments are required (AU-630)

PART NO.	NAME	REMARK
1411	COMPOSITE SIGNAL GENERATOR	TEKTRONIX
TSG 300	COMPONENT SIGNAL GENERATOR	TEKTRONIX
———	SINEWAVE SIGNAL GENERATOR	Frequency Bandwidth 20 MHz
205/2	VIDEO SWEEP GENERATOR	SHIBASOKU MAKER 0.1, 1, 2, 3, 4.43, 5.5, 8, 10
———	DIGITAL VOLT METER	
———	FREQUENCY COUNTER	
———	DUAL TRACE OSCILLOSCOPE	Frequency Bandwidth more than 100 MHz
———	VTVM or ACVM	Frequency Bandwidth 4 Hz~500 kHz
1485R	WAVEFORM MONITOR	TEKTRONIX
WFM-300	WAVEFORM MONITOR	TEKTRONIX
521A	VECTOR SCOPE	TEKTRONIX
———	SPECTRUM ANALYZER	Frequency Bandwidth 10 Hz~120 MHz
———	DC POWER SUPPLY	0 V~12 V, 2 A
1751	SCH METER	TEKTRONIX
1510	DISTORTION METER	SOUND TECHNOLOGY
VFM7180EG	ALIGNMENT TAPE	Panasonic Service Tool
VFK0408	COMPONENT IN CABLE	Panasonic Service Tool
VFK0409	COMPONENT OUT CABLE	Panasonic Service Tool
VPSF2 VPSF E2	SIGNAL / NOISE METER	Rohde & Schwarz

BASIC CONNECTION FOR ADJUSTMENT

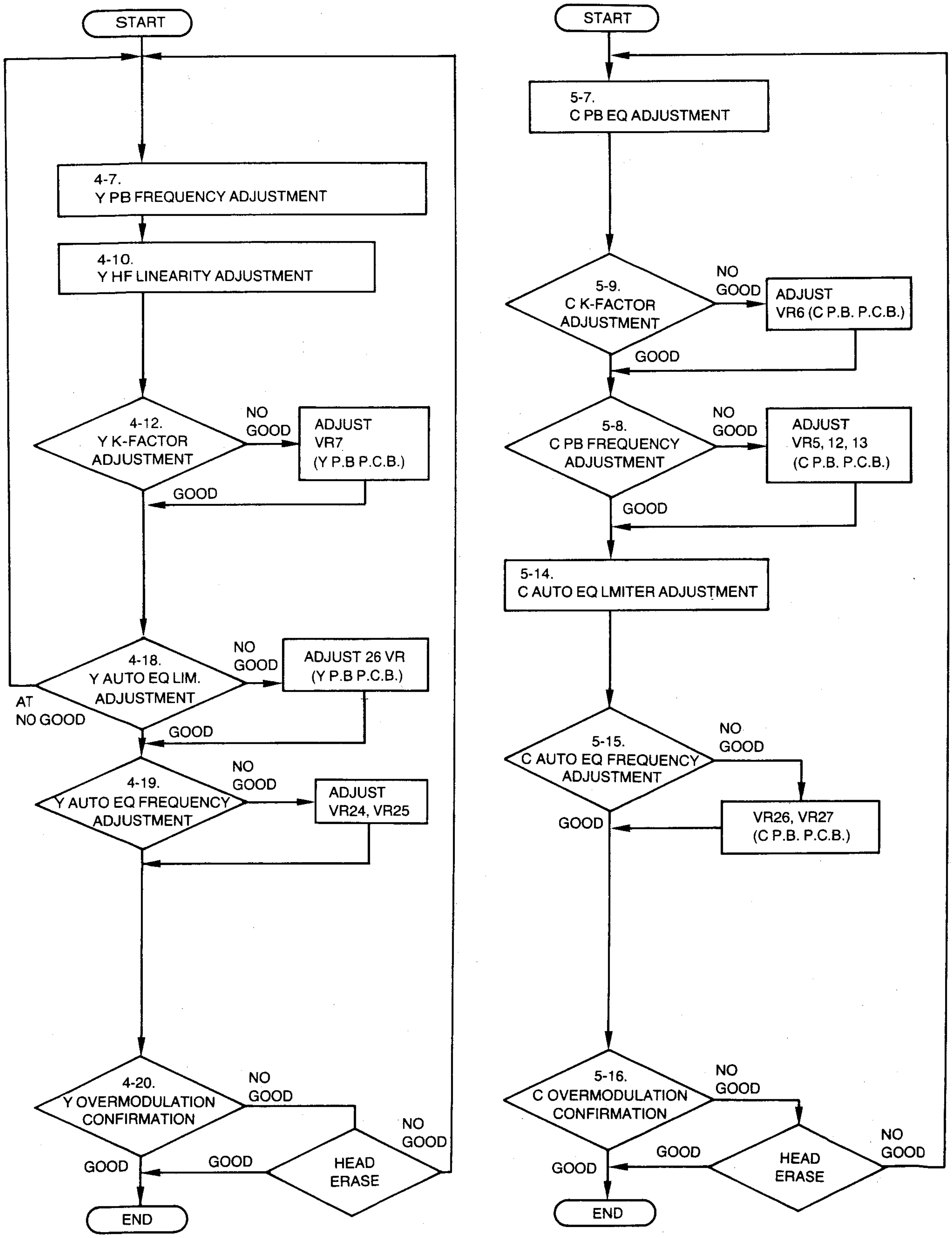


MII FORMAT ALIGNMENT TAPE PAL

MIN:SEC	LINEAR AUDIO SIGNAL	LINEAR AUDIO PURPOSE	FM AUDIO SIGNAL	FM AUDIO PURPOSE	VIDEO SIGNAL	VIDEO PURPOSE
0:00 – 6:00	1KHz 0VU	OUTPUT LEVEL ADJ. LEVEL METER ADJ.	1KHz 0VU	OUTPUT LEVEL ADJ. LEVEL METER ADJ.	COLOUR BAR	VIDEO LEVEL ADJ. PG SHIFTER ADJ. CHROMA PHASE & GAIN ADJ. Y/C TIMING ADJ.
6:00 – 12:00					VIDEO SWEEP	Y,C FREQUENCY EQUALIZER ADJ.
12:00 – 15:00					RAMP	HIGH FREQUENCY LINEARITY
15:00 – 16:00	1KHz REF.	FREQUENCY RESPONSE	1KHz REF.	FREQUENCY RESPONSE	BOW TIE	Y/C TIMING ADJ. NON LINEAR ADJ.
16:00 – 18:00	-10 dBU 40Hz, 63Hz, 125Hz, 250Hz, 500Hz		-10 dBU 40Hz, 63Hz, 125Hz, 250Hz, 500Hz			
18:00 – 21:00	1KHz, 2KHz, 4KHz, 6.3KHz, 8KHz, 10KHz, 12.5KHz, 14KHz, 15KHz (EACH TONE 15 SEC)		1KHz, 2KHz, 4KHz, 6.3KHz, 8KHz, 10KHz, 12.5KHz, 14KHz, 15KHz, 20KHz (EACH TONE 15 SEC)		20T PULSE	Y/C TIMING ADJ. Y/C TIMING CONFIRM
21:00 – 23:00					COLOUR BAR (3H D.O.)	D.O.C.LEVEL ADJ.
23:00 – 26:00	7.5KHz (CH2)	X VALUE ADJ.			Field Skip	X VALUE ADJ.
26:00 – 31:00	3KHz (STEREO)	A/C HEAD HEIGHT ADJ.			Y:8.3MHz C:6.2MHz SINEWAVE	LINEARITY ADJ. HORIZONTAL POSITION (X VALUE ADJ.)
31:00 – 35:00	15KHz	A/C HEAD AZIMUTH ADJ.				

Y/C ADJUSTMENT FLOWCHART

Y(C) FREQUENCY RESPONSE ADJUSTMENT FLOWCHART



ADJUSTMENT PROCEDURES

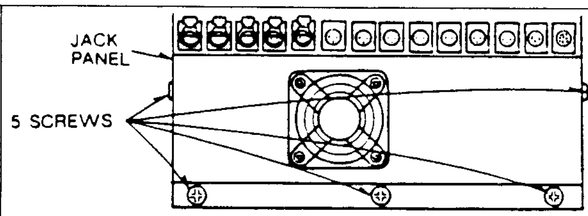
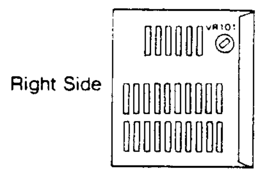
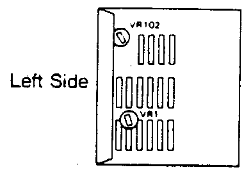
1. POWER SUPPLY-POWER DRIVE SECTION

POWER SUPPLY
(POWER DRIVE(S10))

1-1. VOLTAGE ADJUSTMENTS

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP2 TP3 TP6 TP10 TP9 TP5 TP4 TP8(GND)	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE	D.V.M	---------	VR101(POWER BOX) VR102(POWER BOX) VR1(POWER BOX) VR72(S10) VR89(S10) VR106(S10) VR139(S10)

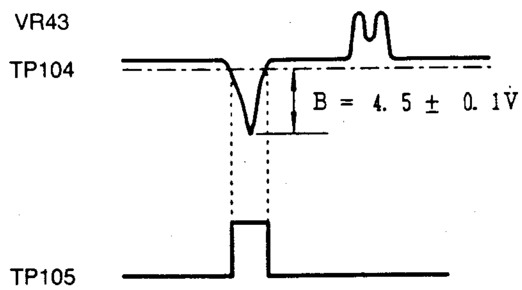
ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1 Unscrew the 5 screws on the rear panel and remove the power box.	
Step 2 TP2=14.2VDC(+/-0.1VDC) TP8(GND)	VR101 
Step 3 TP3=5.07VDC(+/-0.02VDC) TP8(GND)	VR102 
Step 4 TP6=24VDC(+/-0.5VDC) TP8(GND)	VR1
Step 5 TP10=12.0VDC(+/-0.05VDC) TP8(GND)	VR72
Step 6 TP9=12.0VDC(+/-0.05VDC) TP8(GND)	VR89
Step 7 TP5=-12.0VDC(+/-0.05VDC) TP8(GND)	VR106
Step 8 TP4=-5VDC(+/-0.05VDC) TP8(GND)	VR139

2. SERVO SECTION (L5)

2-1. MR HEAD PLAYBACK AMP ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP105 TP104	×1 PLAY VAR or SHTL *NOTE	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	- - - - - -	VR43(MR VR)

ADJUSTMENT PROCEDURE & SPECIFICATION	
*NOTE: Tape speed information can be surperimposed onto the VIDEO3 OUT by the SUPER switch on the front sub panel (L6 DIP SW SW300-1 ON) Adjust VR43 as shown figure.	

2-2. NEUTRAL POSITION VOLTAGE ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP82 TP83	EJECT	BLANK □ TAPE ALIGNMENT ■ TAPE	D.V.M	---------	VR41(S TENSION) VR42(T TENSION)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP82=2.5V(+/-0.002V) TP83=2.5V(+/-0.002V)	VR41 VR42

2-3. REFERENCE LEVEL ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP96	EJECT	☐ BLANK TAPE ☐ ALIGNMENT TAPE	D.V.M	---------	VR38 (OUT LEVEL REF)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP96=150mV(+/-1mVDC)	VR38

2-4. LOADING & UNLOADING VOLTAGE ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP80 TP81	EJECT	☐ BLANK TAPE ☐ ALIGNMENT TAPE	D.V.M	---------	VR34 (LOADING) VR35 (INLOADING)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Turn power off, and remove the CARRIAGE. Connect the dummy plug (1) into P406 connector. Turn power on TP80=220mV(+/-1mV)	VR34
Step 2 TP81=240mV(+/-1mV)	VR35

2-5. TENSION ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP78 TP79 TP82 TP83	EJECT PLAY SLOW×1 SLOW×-1	BLANK □ TAPE ALIGNMENT ■ TAPE	D.V.M	--------	VR27(T REV) VR28(T FWD) VR29(SKEW) VR33(S FWD/REV)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Turn power off, and remove the CARRIAGE Connect the dummy plug (1) into P406 connector. Turn power on EJECT mode	Connect the D,V,M to TP82 and measure the voltage (VS) Connect the D,V,M to TP83 and measure the voltage (VT)
Step 2 Turn power off, and connect the Jumper wire between TP86, TP88, and TP85(+12V line) PLAY mode without a tape TP78=VS+/-0.002V	VR29
Step 3 SLOW×1 mode (VAR or SHTL) TP78=VS+/-0.002V TP79=VT+/-0.002V *NOTE: Tape speed information can be superimposed onto the VIDEO3 out by the super switch on the front sub panel (L6 DIP SW SW300-1 ON)	VR33 VR28
Step 4 SLOW×-1 mode (VAR or STHL) TP79=VT+/-0.002V Remove the jumper wires and dummy plug	VR27

2-6. HIGH SPEED START TORQUE ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP94	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE BEGINING PORTION	D.V.M	----------	VR39 (SPEED TRQ)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP94=280mV(+/- 2mv)	VR39

2-7. TENSION DETECTOR ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP84 TP85 TP86 TP87 TP88	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	D.V.M	--------	VR36 (S SLACK) VR37 (T SLACK)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Note:Befor this adjustment, Tension adjustment (Supply and Take up) are completed. Turn power off, remove the CARRIAGE, and connect the dummy plug (1) to P406. Connect the jumper wires between TP86, TP88 and TP85 (+12V line) PLAY mode without a tape	Measure the DC voltage at TP84 (Note this as ES) Measure the DC voltage at TP87 (Note this as ET) Be sure to measure the minimum value of ES and ET.
Step 2 Remove the jumper wires.	Confirm that the TAPE SLACK is indicated on the display.
Step 3 TP86=(ES-1)V+0.5V/-OVDC TP88=(ET-1)V+0.5V/OVDC	Note:If either output level (ES-1) VR36 or (ET-1) is less than 5 volts, adjust VR37 either VR36 or VR37 to (ES -0.3) or (ET-0.3) at TP86 or TP88 respectively.

2-8. DRUM REFERENCE VOLTAGE ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP38 TP35	STOP	BLANK ☐ TAPE ALIGNMENT ■ TAPE	D,V,M	-----	VR15(DRUM REF) VR12(-5V ADJ)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 TP38=2.5V(+/-0.1VDC)	VR15
Step 2 TP35=-5.0V(+/-0.1VDC)	VR12

2-9. CAPSTAN REFERENCE SIGNAL ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Pin 14 of IC38	STOP	BLANK ☐ TAPE ALIGNMENT ■ TAPE	FREQUENCY COUNTER	- - - - - - -	VCI (INT 50HZ)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Pin 14 of IC38=50+/-0.001(HZ)	VC1

2-10. CAPSTAN REFERENCE VOLTAGE ADJUSTMENT

(L5 SERVO)

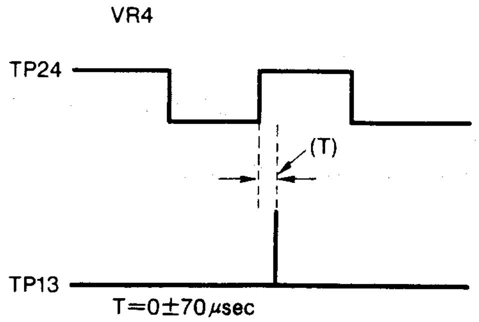
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP19	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	D,V,M	- - - - - - -	VR5 (CAP REF)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP19=3.6V(+/-0.02VDC)	VR5

2-11. CAPSTAN PHASE ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP24 TP13	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	- - - - - - -	VR4 (V REF 2)

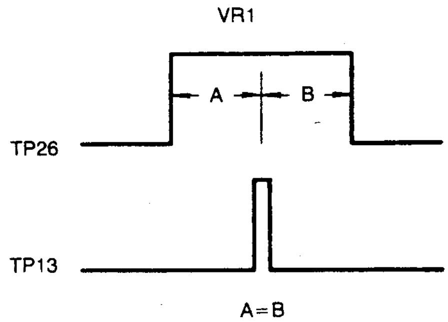
ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR4 as shown in figure	

2-12. CAPSTAN LOCK GATE ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP26 TP13 TP27	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	OSCILLO SCOPE	- - - - - - - -	VR1 (LOCK GATE1)

ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1
Adjust VR1 as shown in figure



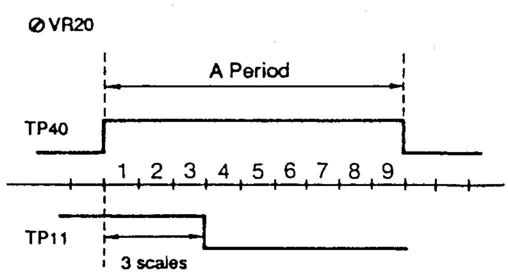
Step 2
Confirm→TP27 LOW(PLAY)
HIGH(STOP)

2-13. TRACKING FIX ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP11 TP40	PLAY	□ BLANK TAPE □ ALIGNMENT TAPE LINEARITY PORTION	OSCILLO SCOPE	---------	VR20 (TR FIX)

ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1
Disconnect the connector P1 on AT Board (S9) to stop the auto tracking function.
Adjust VR20 as shown figure.



2-14.EXT FINE SPEED ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP4	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	FREQUENCY COUNTER VARIABLE POWER SUPPLY (0-12V,2A)	- - - - - - - -	VR7 (SYNCRO SHIFT) VR6(SYNCRO GAIN)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Supply 5.2VDC to pin 46 of the 50 pin remote connector. TP4=1800HZ(+/-5HZ)	VR7
Step 2 Supply 2.2VDC to pin 46 of the 50 pin remote connector. TP4=2160HZ(+/-5HZ)	VR6

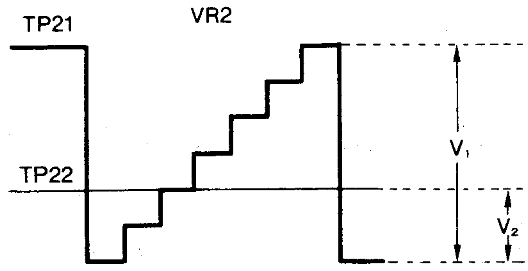
2-15. 1/32 SLOW SPEED ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP21 TP22 TP23 TP5	X 1/16 SLOW X 1/32 SLOW	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR2(X 1/32 A) VR3(X 1/32 C)

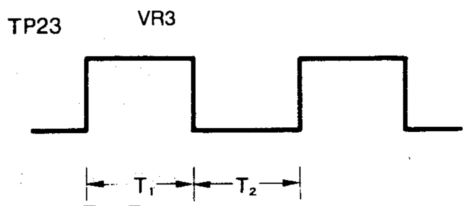
ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1
Place the unit in the x 1/16 SLOW mode
(PUSH the x 1/16 PRESET SLOW Button)
Adjust VR2 as shown in figure



TP22: $V_2=\frac{V_1}{4}$

Step 2
Place the unit in the x 1/32 SLOW
(Push the x 1/32 PRESET SLOW Button)
Adjust VR3 as shown in figure



$T_1 : T_2 = 4 : 6 \sim 6 : 4$

Step 3
TP5=56.0HZ(+/-5HZ)

VR3
If can not be adjusted VR3 adjustment,
Please re-adjust VR2 adjustment

2-16.DRUM FG AMP ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP31	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE		VL1 (FG LEVEL)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VL1 as shown in figure

TP31 VL1

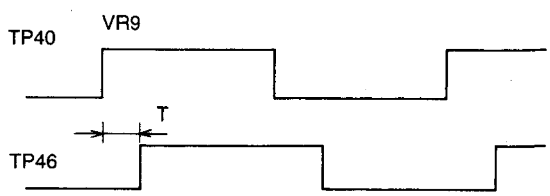
Maximum level without distortion

2-17.REFERENCE SIGNAL ADJUSTMENT (L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP40 TP46	STOP	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR8 (EDIT SHIFTER) VR9

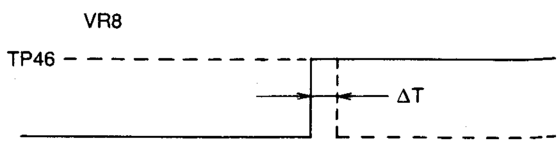
ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1
Adjust VR9 as shown in figure



T=250±5 μsec

Step 2
Adjust VR8 so that the difference between the rising and folling edge in less than 2.0 usec



difference

2-18. D/A GAIN ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP37 TP36	EJECT	BLANK ☐ TAPE ALIGNMENT ☐ TAPE	D.V.M.	--------	VR13 (D/A GAIN 1) VR14 (D/A GAIN 2)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Connect the jumper wires between TP49,TP50,TP34 and GND, TP36=5.0V(±0.1V)	VR13
Step 2 TP37=5.0V(+/-0.1 V)	VR14 Remove the jumper wires

2-19. LOCK GATE 1 ADJUSTMENT

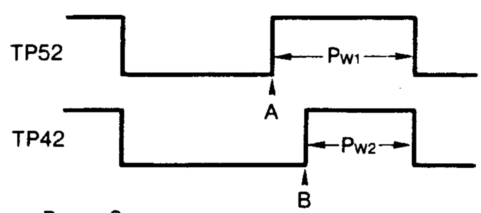
(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP52 TP42 TP44 + SIDE OF C148	PLAY ↓ EJECT	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR18 (LOCK GATE)

ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1
PLAY mode
Adjust VR18 as shown in figure

VR18



$$\frac{P_{W2}}{P_{W1}} = \frac{3}{4} \pm 2 \ [\%]$$

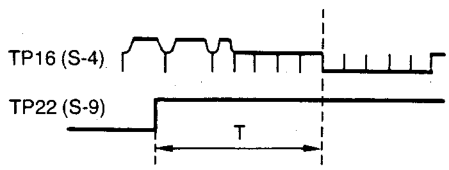
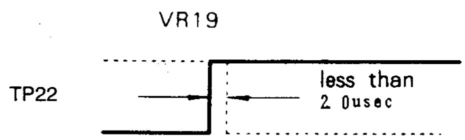
Step 2
Confirm that the DC level as shown in figure

	+side of C148	TP44
PLAY	L	L
EJECT	H	H

2-20.PG SHIFTER ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP22 (S9) TP16 (S4)	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR19 (PG-) SW1,2

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Set VR19 to the centre of its rotation. Adjust SW1,2 as shown in figure	 T=3.75±0.1 [H]
Step 2 Adjust VR19 so that the rising and falling edge is less than 2.0 usec as shown in figure.	 Note: This may be seen by switching the scope trigger from (+) to (-) slope select.

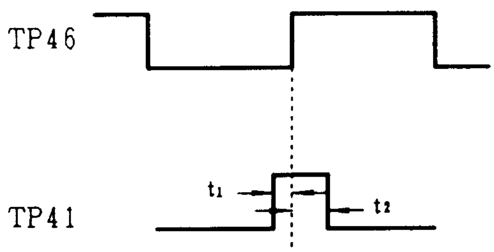
2-21.GAIN SWITCHING ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP41 TP46	STOP	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR16 (GATE R1) VE17 (GATE R2)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR16/VR17 as shown figure.



$t_1 = 1.5 \pm 0.1$ msec VR16

$t_2 = 2.5 \pm 0.1$ msec VR17

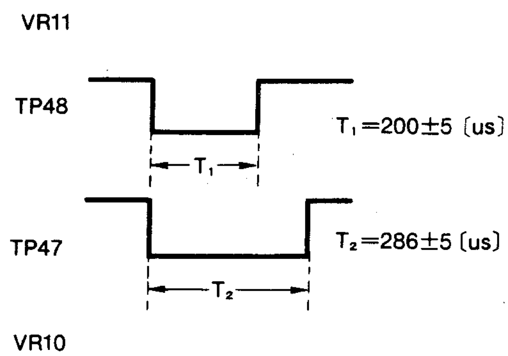
2-22.GATE PULSE ADJUSTMENT

(L5 SERVO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP47 TP48	STOP	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR10 (CK GATE) VR11 (GATE 1)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR10/VR11 as shown in figure.



3. TBC & SYNC GENE SECTION (L1)

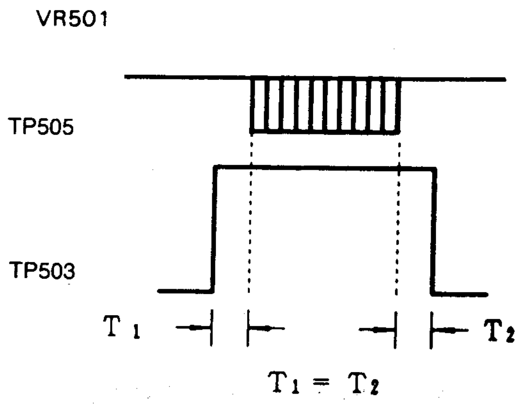
3-1. BURST FLAG PULSE ADJUSTMENT

(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP503 TP505	EJECT	BLANK ☐ TAPE ALIGNMENT ☐ TAPE	OSCILLO SCOPE	REF VIDEO IN :COLOUR BAR (SCH:0°)	VR501 (BF PULSE)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR501 as shown figure.



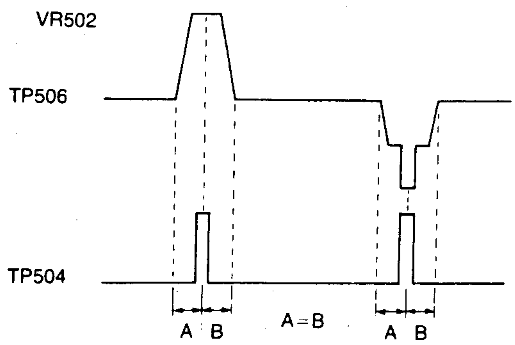
3-2. SAMPLE AND HOLD ADJUSTMENT

(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP506 TP504	EJECT	BLANK ☐ TAPE ALIGNMENT ☐ TAPE	OSCILLO SCOPE	REF VIDEO IN :COLOUR BAR (SCH:CORRECT)	VR502 (S/H PHASE)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR502 as shown figure.
Note:IF the wavefrom at TP506 is unstable (jittering) turn slowly C558 until the error voltage signal (TP506) appears every horizontal lines.

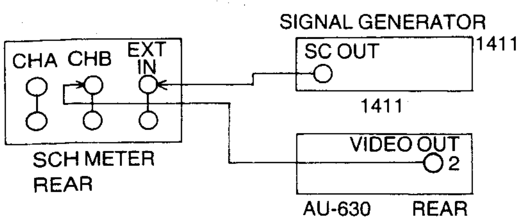


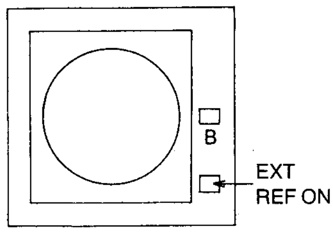
3-3. 17.7 MHz VCO ADJUSTMENT (1)

(L1 TBC1)

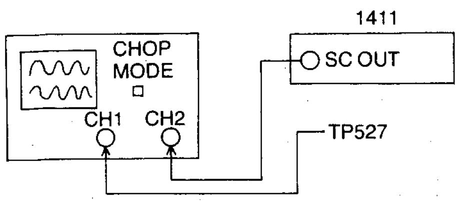
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP527 VIDEO OUT 2	EJECT	☐ BLANK TAPE ☐ ALIGNMENT TAPE	SCH METER OSCILLO SCOPE	REF VIDEO IN : NO SIGNAL	C558 (17.7MHZ VCO)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1	Adjust C558 so that the burst signal rotation is stop. (less than one rotation during 2 seconds)





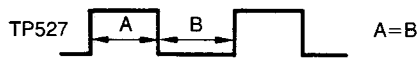
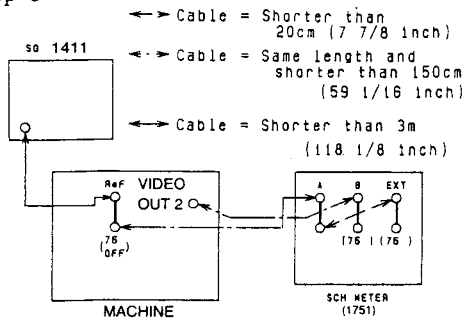
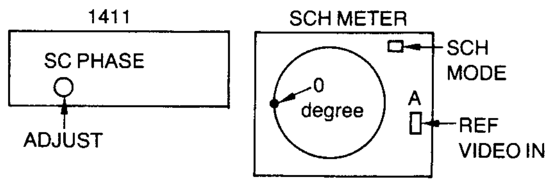
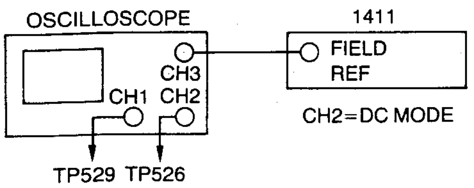
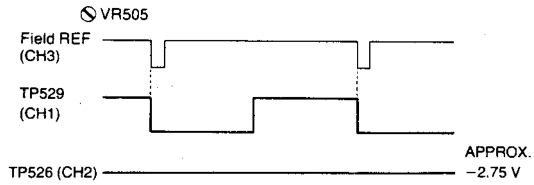
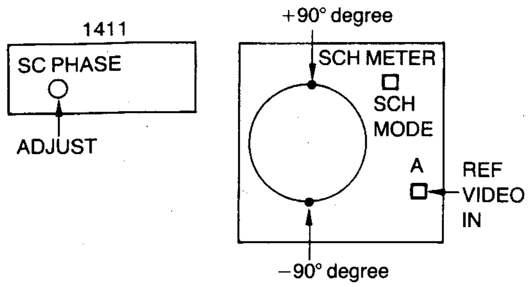
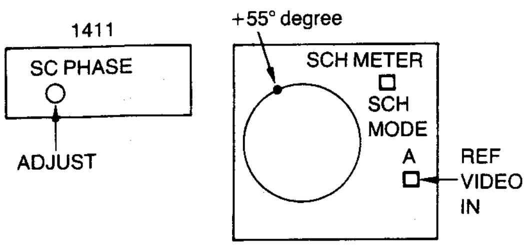
Step 2	Confirm that the reference burst signal and the woveform at TP527 is phase locked.

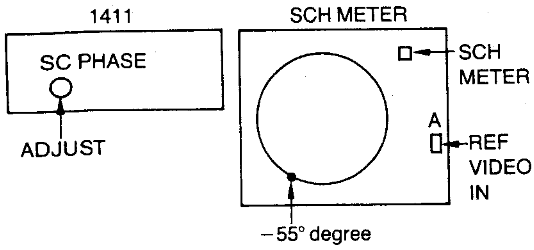


3-4. REF SCH ADJUSTMENT

(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP531 TP529 TP526 TP533 TP534	EJECT	☐ BLANK TAPE ☐ ALIGNMENT TAPE	SCH METER OSCILLO SCOPE	REF VIDEO IN :COLOUR BAR	VR523 (SC DUTY) VR505 (SCH DET) VR506 (SCH L) VR507 (SCH H)

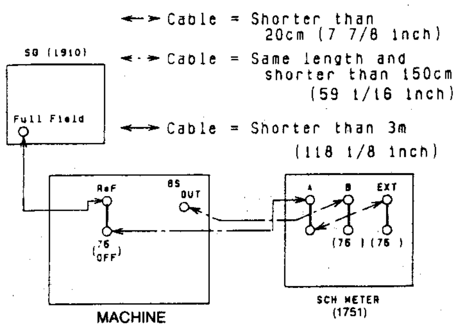
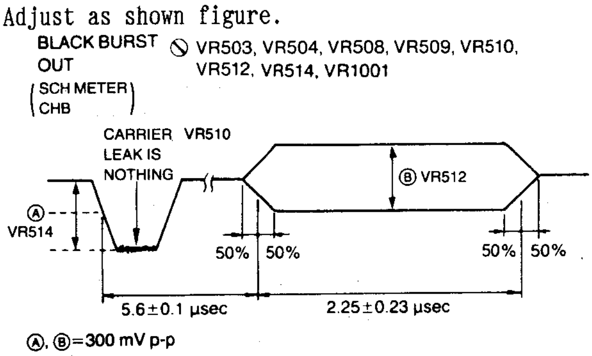
<table>
<tr><th colspan="2">ADJUSTMENT PROCEDURE & SPECIFICATION</th></tr>
<tr><td>Step 1
Remove the socket of SW504.
Connect the scope to TP527</td><td>Adjust VR523 as shown figure.
</td></tr>
<tr><td>Step 2
Connect the scope to TP531.</td><td>Confirm that the overmodulation pulse
is changed during VR505 adjustment.
(Time length : .1msec)
turn VR505 to fully counterclockwise</td></tr>
<tr><td>Step 3 Connection as shown below.
</td><td></td></tr>
<tr><td>Step 4
Connection as shown below.

Set the scope to TRIPPLE mode.</td><td>Adjust VR505 from fully counter clockwise so that the waveform of CH1 and CH3 is shown below.
</td></tr>
<tr><td>Step 5
</td><td>Slowly turn VR505 to clockwise, and adjust VR505 so that the DC level of TP526 stafilizes OV on the scope.</td></tr>
<tr><td>Step 6
</td><td>Adjust VR507 so that the DC level of TP534 and TP526 are match.</td></tr>
</table>

Step 7 	Adjust VR506 so that the DC level of TP533 and TP526 are match.
Step 8 Reinstall the socket of SW504.	

3-5. BURST SYNC ADJUSTMENT

(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
BS OUT	EJECT	BLANK ☐ TAPE ALIGNMENT ☐ TAPE	SCH METER (1751)	REF VIDEO IN :COLOUR BAR	VR503 (H PHASE 1) VR504 (BS SC PHANE) VR509 (BF WID) VR508 (AF PHASE) VR510 (BURST CAL) VR512 (BURST G) VR514 (SYNC G) VR1001 (BURST PHASE)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Remove the socket of SW504. connect as shown below.  · SCH METER = WFM MODE	Adjust as shown figure.  Adjust VR514 as shown in figure. Adjust VR510 as shown in figure. Adjust VR503 so that the sync phase of BS OUT is same phase with REF signal.
Step 2. · SCH METER = SCH MODE	Adjust VR504 and VR1001 so that the SCH of BS OUT is same phase with REF signal.
Step 3. · SCH METER = VECT MODE	Adjust VR512 so that the BURST LEVEL is on the 100% marker.
Step 4. · SCH METER = WFM MODE	Adjust VR508 and VR509 so that the phase of burst and burst wicth as chown in figure.

3-6. 17.7 MHz VCO ADJUSTMENT (2)

(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP530 TP517	EJECT	BLANK ☐ TAPE ALIGNMENT ☐ TAPE	D.V.M.	REF VIDEO IN :COLOUR BAR	VR525 (17.7M VCO2) VR518 (17.7M VCO3)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP530=2.5V+/-0.1VDC TP517=2.5V+/-0.1VDC	VR525 VR518

3-7. SYS SC AND SCH PHASE ADJUSTMENT

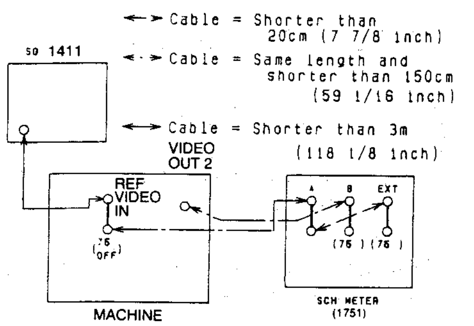
(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO 2 OUT	EJECT	BLANK ☐ TAPE ALIGNMENT ☐ TAPE	SCH METER (1751)	REF VIDEO IN :COLOUR BAR (SCH: 0°)	VR515(H PHASE 2) VR516(SYS SC PHASE) VR521(13.5M VCO1) SYS SC COARSE SCH COARSE SYS SC PHASE SCH PHASE

ADJUSTMENT PROCEDURE & SPECIFICATION

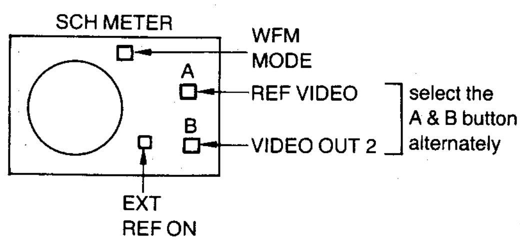
Step 1

·Connection as shown below.

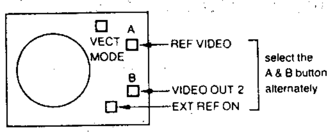


·Set the SYS SC PHASE VR on the pull out drawer and SCH PHASE VR on the sub front panel to clik position.

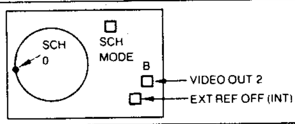
Adjust VR 515 so that the H phase of VIDEO OUT 2 is same phase with REF. signal.



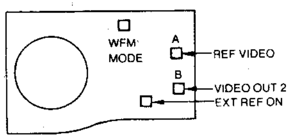
Step 2
·Adjust VR516 and SYS SC COARSE VR on the PULL OUT DRAWER so that the BURST PHASE is matched the signal.



Step 3
·Adjust VR512 so that the SCH phase of VIDEO OUT2 is 0 dgree.



Step 4
·Adjust VR 515 so that the H phase of VIDEO OUT 2 is same phase with REF. signal.



3-8. VIDEO PHASE ADJUSTMENT

(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO OUT 2	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	SCH METER (1751)	REF VIDEO IN :COLOUR BAR (SCH : 0°)	VR552 (13.5M VC02)

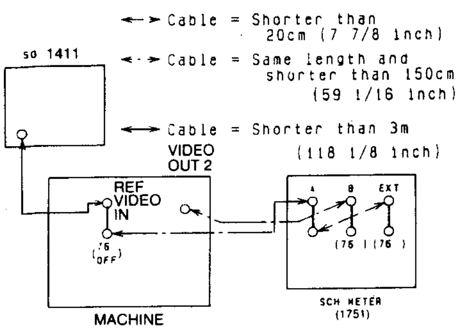
ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1.
·SW3-1(L6)----ON
·SW402(L3)----OFF
·SW8(L1)------OFF

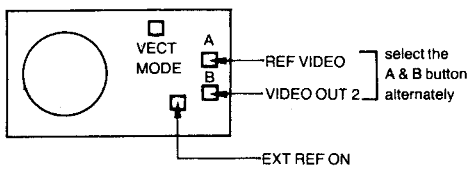
·Turn VIDEO PHASE VR on the pullout drawer to CCW so that the monitor picture is left side on the monitor.

·Turn this VR to clockwise until the monitor picture move 3 steps to right side.

Step 2
Connection as shown below.



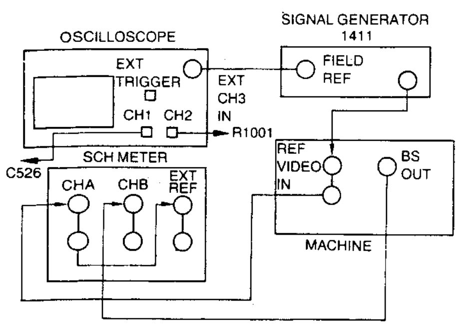
Adjust VR522 so that the VISC phase is matched burst axis.

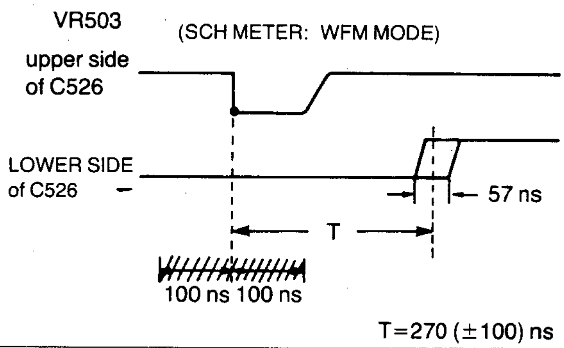


3-9. BLACK BURST PHASE ADJUSTMENT (L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
BS OUT UPPER SIDE OF C526 LOWER SIDE OF R1001	EJECT	BLANK ☐ TAPE ALIGNMENT ☐ TAPE	SCH METER OSCILLO SCOPE	------	VR503(H PHASE1)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Connection as shown below	·When power switch turns from off to on, observe the phase relation between CHA and CHB. ·Adjust VR503 so that the H phase of CHA and CHB look alike. ·Then, measure the T portion of the scope as shown in figure. ·Confirm that the T portion is 270 nsec.



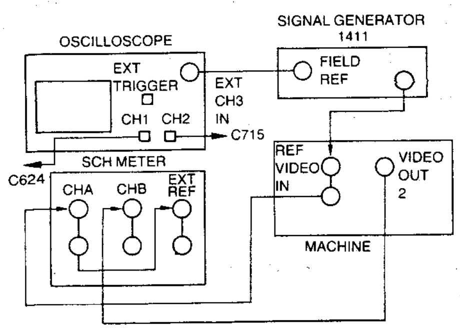


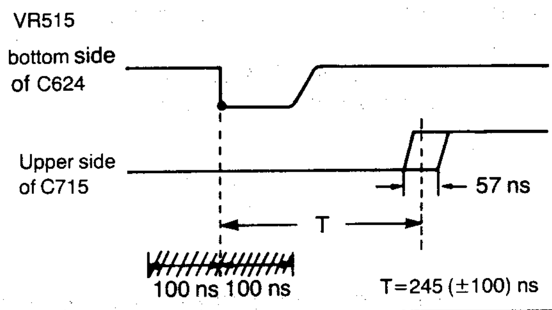
3-10.SYS H PHASE ADJUSTMENT

(L1 TBC1)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO 2 OUT bottom side of C624 upper side of C715	STOP	☐ BLANK TAPE ■ ALIGNMENT TAPE	SCH METER OSCILLO SCOPE	---------	VR515 (H PHASE 2)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Connection as shown below.	·When power switch turns from off to on, observe the phase relation between CHA and CHB ·Adjust VR 515 so that the H phase of CHA and CHB look alike. ·Then, measure the T portion of the scope as shown in figure. ·Confirm that the T portion is 245 nsec.



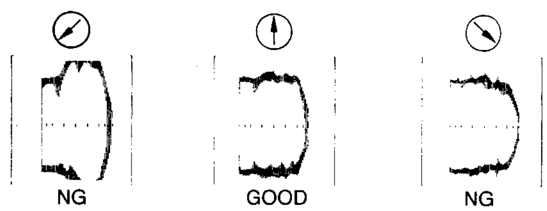
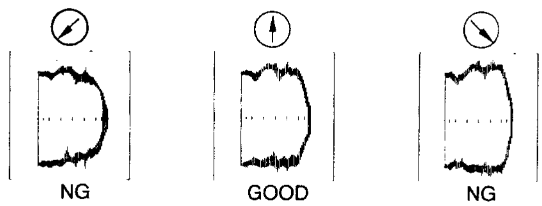


4. Y PB SECTION (S4)

4-1. Y PB EQ TERMINATION ADJUSTMENT

(S4 Y PB)

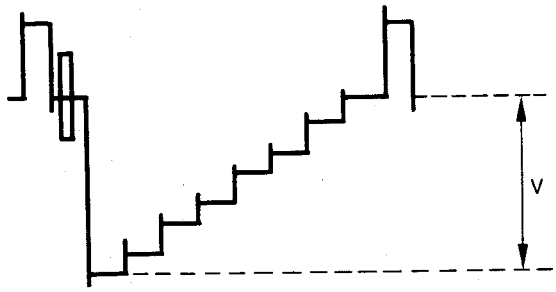
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Y OUT	PLAY	BLANK ☐ TAPE	WFM MONITOR	----------	VR3 (TERM 1) VR4 (TERM 2)
		ALIGNMENT ■ TAPE 60% SWEEP PORTION			

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Set the VR3 (TERM 1) at 12:00 o'clock position. Confirm that the frequency characteristic is flat. If it is not, adjust VR3 so that the frequency characteristic is flat.	VR3 (TERM 1) ---> 12:00 o'clock 
Step 2. Set the VR4 (TERM 2) at 12:00 o'clock position. Confirm that the frequency characteristic is flat. If it is not, adjust VR4 so that the frequency characteristic is flat.	VR4 (TERM 2) ---> 12:00 o'clock 

4-2. Y NL DE EMP LEVEL ADJUSTMENT

(S4 Y PB)

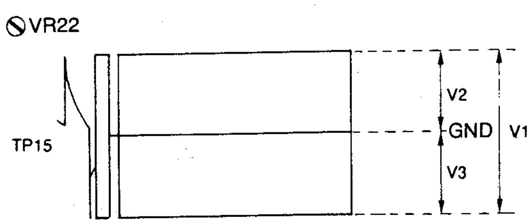
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP13	PLAY	BLANK ☐ TAPE	OSCILLO SCOPE	----------	VR20 (NL. LEV)
		ALIGNMENT ■ TAPE COLOUR BAR PORTION			

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR20 as shown figure.	 SPEC V=1.1 ± 0.01Vp-p

4-3. Y LIMITER LEVEL ADJUSTMENT

(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP15 TP16 (for Trigger)	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE BOWTIE PORTION	OSCILLO SCOPE	----------	VR21 (NL. LIM LEV) VR22 (NL. LIM BAL)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Adjust VR22 as shown figure. V2 and V3 level ---> Balanced	
Step 2. Adjust VR21 as shown figure. V1,V2 and V3 level ---> In a spec.	SPEC V1=360 ± mVp-p V2=V2

4-4. Y 3.375MHz BPF ADJUSTMENT

(S4 Y PB)

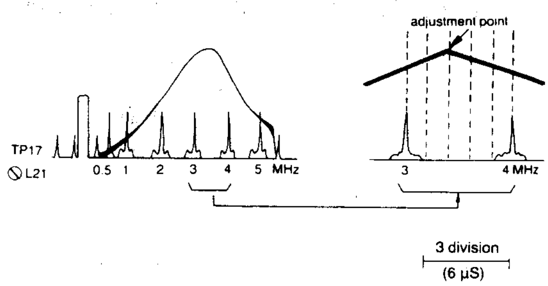
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP17	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 60% SWEEP Recorded by AU-650B	OSCILLO SCOPE	--------	L21

ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1.
OSCILLOSCOPE SETTING
DELAY Mode by 2us/div between 3MHz and 4MHz Portion.

Step 2.

Adjust L21 as shown figure.



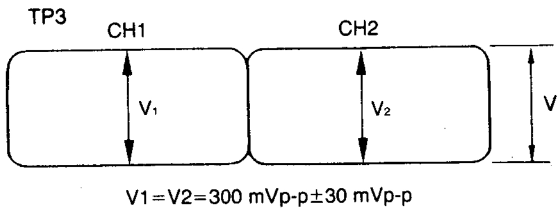
4-5. Y PB RF LEVEL ADJUSTMENT (1)

(S1 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP3	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR1 (AT RF LEVEL)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR1 as shown figure.



4-6. Y D.O.C LEVEL ADJUSTMENT

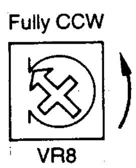
(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP6 TP9 TP10	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR8 (V-V RF LEVEL) VR18 (DOC DET LEV.) VR19 (DOC DET BAL)

ADJUSTMENT PROCEDURE & SPECIFICATION

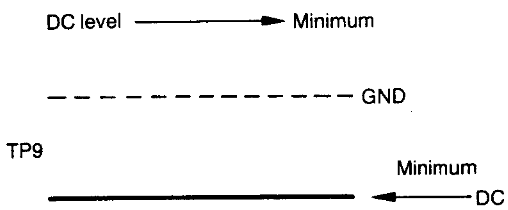
Step 1.

Adjust VR8 as shown figure.



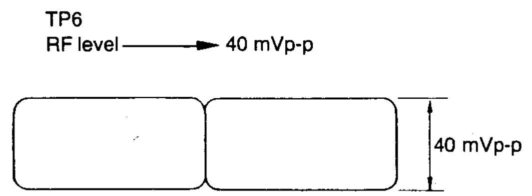
Step 2.

Play back the colour bar portion.



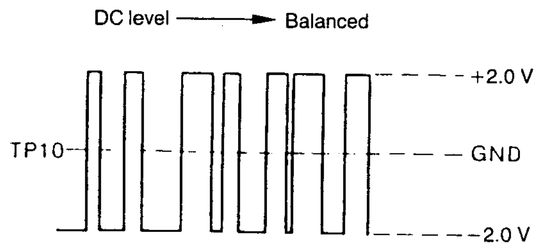
Step 3.

Adjust VR8 as shown figure.



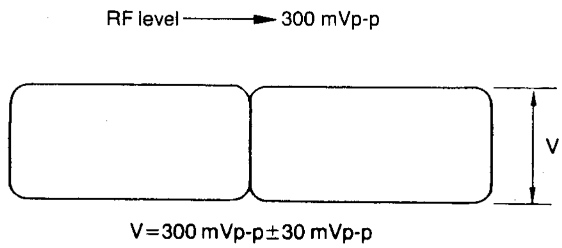
Step 4.

Adjust VR18 as shown figure.



Step 5.

Adjust VR8 as shown figure.



4-7. Y PB FREQUENCY ADJUSTMENT

If spectrum analyzer is available.

(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP6	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 60% SWEEP PORTION	SPECTRUM ANALYZER	--------	VR6 (EQ 4) VR7 (EQ 3) VR13 (EQ 1 AT CH1) VR14 (EQ 1 AT CH2) VR16 (EQ 2 AT BAL) Y PLAY EQ(Front Sub)

ADJUSTMENT PROCEDURE & SPECIFICATION

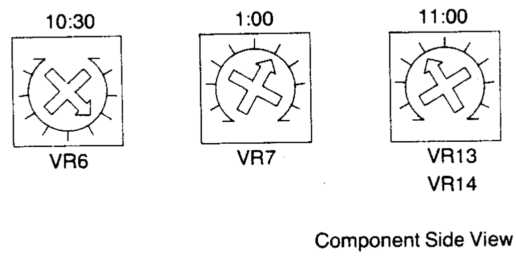
Step 1.

Set the spectrum analyzer.

CENT FREQ	:	8.3MHz
SPAN	:	10MHz
REF	:	-22dB
SHIFT	:	5dB
BAND	:	100KHz
VIDEO BAND	:	300KHz
SWEEP TIME	:	5sec

Step 2.

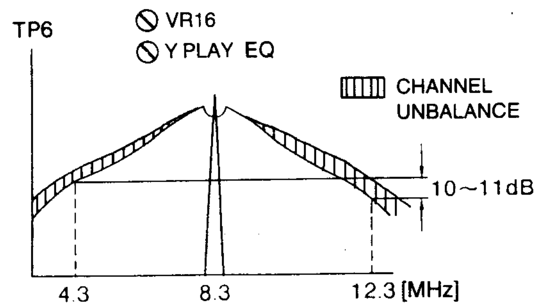
Set the position of VRs.



Step 3.

Adjust VR16 and Y PLAY EQ on the Front sub panel as shown below.

Channel Balance ----> Balanced
Side Band Ratio ----> 10 ~ 11dB



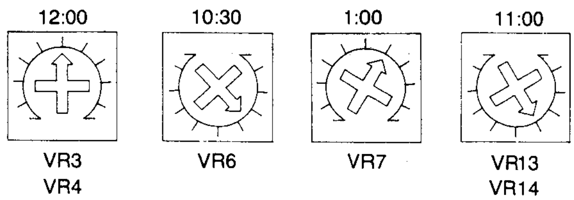
Y PB FREQUENCY ADJ. 1
If spectrum analyzer is not available. (S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Y OUT	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 60% SWEEP PORTION	WFM MONITOR	---------	VR6 (EQ 4) VR7 (EQ 3) VR13 (EQ 1 AT CH1) VR14 (EQ 1 AT CH2) VR16 (EQ 2 AT BAL) Y PLAY EQ(Front Sub)

ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1.
VR Setting 1

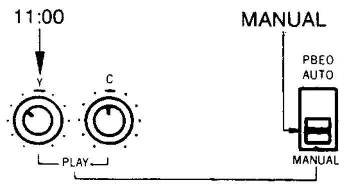
Set the position of VRs.



Component Side View

Step 2.
VR Setting 2

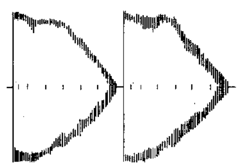
Adjust Y PB EQ as shown figure.



Step 3.

Adjust VR13, VR14 as shown figure.

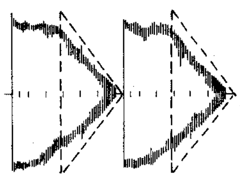
VR13,VR14 ----› Fully CCW



Step 4.

Adjust VR3, VR4 so that the frequency characteristic is shown figure.

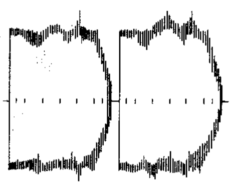
Make a triangle waveform



Step 5.

Adjust VR13, VR14 as shown figure.

Make a flat waveform



(S4 Y PB)

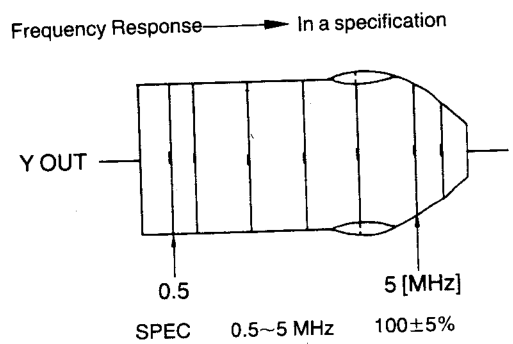
4-8. Y PB FREQUENCY ADJ (2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Y OUT	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 60% SWEEP PORTION	WFM MONITOR	----------	VR13 (EQ 1 AT CH1) VR14 (EQ 1 AT CH2)

ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1.

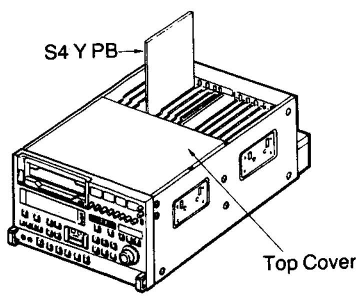
Adjust VR13, VR14 as shown figure.



Step 2.
Confirm that the frequency response is in a specification.

SPEC
REF : 500KHz
1MHz : 95 ~ 105%
2MHz : 94 ~ 104%
3MHz : 92 ~ 103%
4MHz : 91 ~ 102%
5MHz : 90 ~ 101%

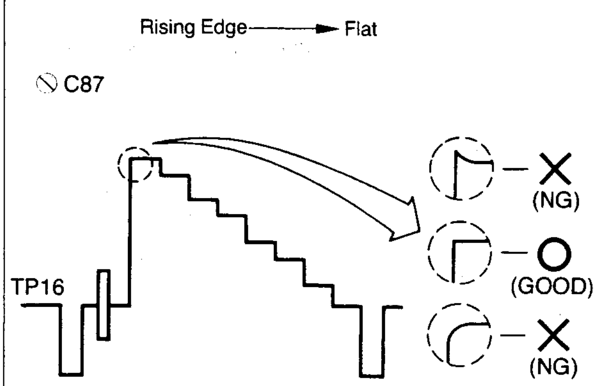
Note :
It should be better to cover the half of top by top panel while adjusting.



4-9. Y K FACTOR ADJUSTMENT

(S4 Y PB)

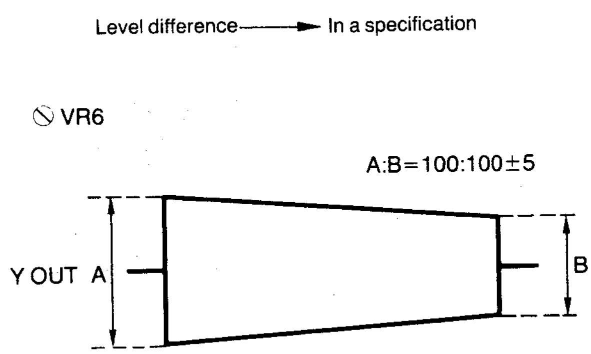
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP16	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	----------	C87 (K B)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust C87 as shown figure.	

4-10.Y HF LINEARITY ADJUSTMENT

(S4 Y PB)

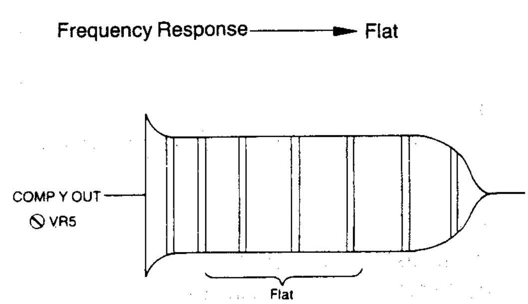
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Y OUT	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE RAMP SIGNAL Recorded by AU-650B	WFM MONITOR	----------	VR6 (EQ 4)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. WFM Monitor Setting	RESPONSE : 4.43 B P F mode.
Step 2. Adjust VR6 as shown figure. Note : If it in the specification before adjustment, do not adjust VR6 (EQ 4).	

4-11.SEARCH EQ ADJUSTMENT

(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Y OUT	REV X32	BLANK TAPE ALIGNMENT TAPE 60% SWEEP PORTION	WFM MONITOR	--------	VR5 (SEARCH EQ)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR5 as shown figure.	

4-12.Y K-FACTOR ADJUSTMENT (2)

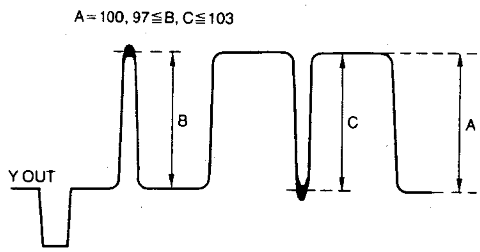
(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Y OUT	PLAY	☐ BLANK TAPE ☐ ALIGNMENT TAPE SIN2 2T Recorded by AU-650B	WFM MONITOR	---------	VR7 (EQ 3)

ADJUSTMENT PROCEDURE & SPECIFICATION

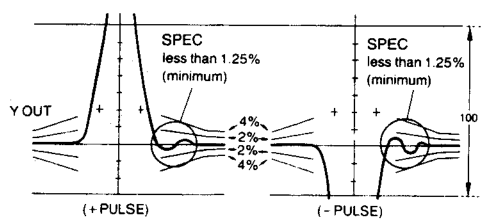
Step 1.

Confirm KA of + Pulse and - Pulse



Step 2.

Confirm Kp of + Pulse and - Pulse



Step 3.
If out of spec. ----> Adjust VR7 (EQ 3)

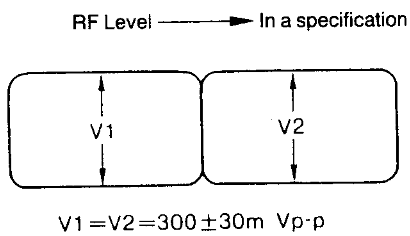
Note 1 :
If adjust VR7, frequency response confirmation is necessary.

Note 2 :
Measure the centre portion of Noise.Moire while adjustment.

4-13.Y PB RF LEVEL ADJUSTMENT (2)

(S4 Y PB)

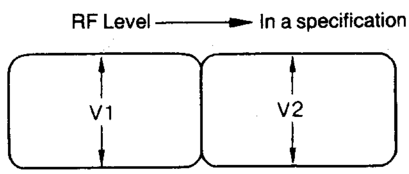
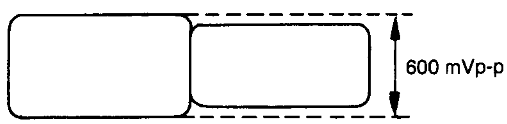
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
		BLANK ☐ TAPE			
TP6	PLAY	ALIGNMENT ∴ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	--------	VR8 (V-V RF LEV)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR8 as shown figure.	

4-14.Y WFM RF LEVEL ADJUSTMENT

(S4 Y PB)

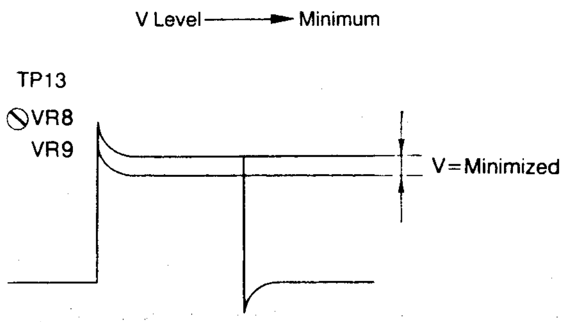
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
		BLANK ☐ TAPE			
WFM OUT (Y RF)	PLAY	ALIGNMENT ∴ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	-------	VR17 (WFM RF LEV)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR17 as shown figure.	 V1 = V2 = 600 +/- 100mVp-p
If there is a channel difference, RF level should be adjusted at average level between CH1 and CH2.	

4-15.Y CARRIER BALANCE ADJUSTMENT

(S4 Y PB)

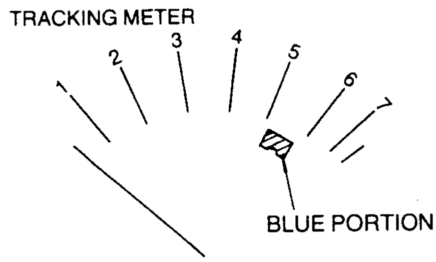
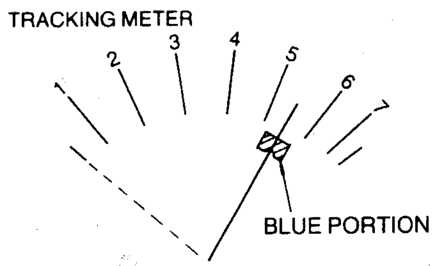
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP13	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	--------	VR9 (LIMITER BAL) VR10 (DEMODU BAL)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR8, VR9 as shown figure.	

4-16.TRACKING METER ADJUSTMENT

(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TRACKING METER (Front Panel)	EJECT PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 100% COLOUR BAR PORTION	--------	----------	VR28 (RF METER LEV) VR29 (RF METER EERO)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Machine Condition	TRACKING/CH4 SW ---> TRACKING
Step 2. Adjust VR29 as shown figure.	In the EJECT mode. 
Step 3. Adjust VR28 as shown figure.	Playing back the colour bar portion. 
Step 4. Confirm the meter indication smoothly by turning the TRACKING VR.	

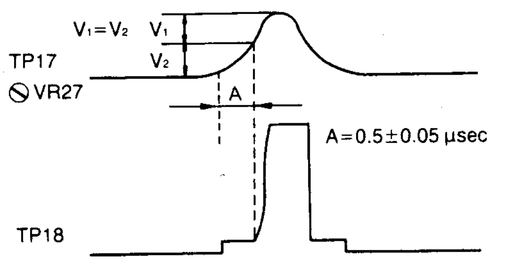
4-17.Y S/H PULSE PHASE ADJUSTMENT

(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP17 TP18	PLAY	☐ BLANK TAPE ALIGNMENT TAPE 60% SWEEP PORTION	OSCILLO SCOPE	----------	VR27 (BURST S/H POS)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR27 as shown figure.



OSCILLO : 0.5usec DELAY

4-18. Y AUTO EQ LIMITER ADJUSTMENT

(S4 Y PB)

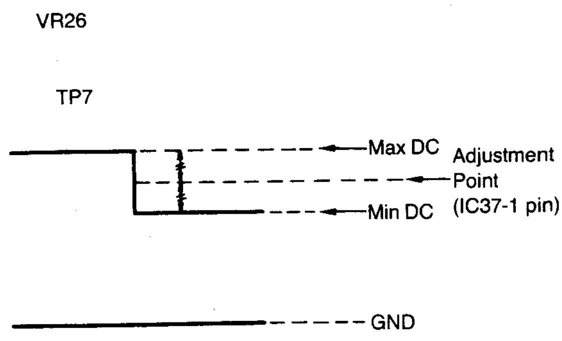
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP7 IC31 - 1pin	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 60% SWEEP PORTION	OSCILLO SCOPE	----------	VR26 (AUTO EQ LIM)

ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1.
Measure Maximum DC and Minimum DC at TP7 while Playback.

Step 2.

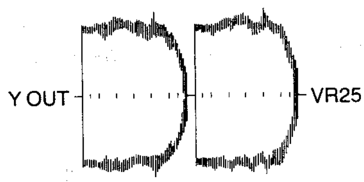
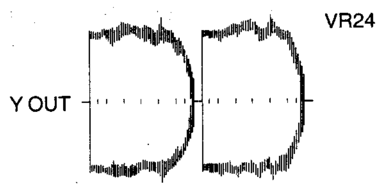
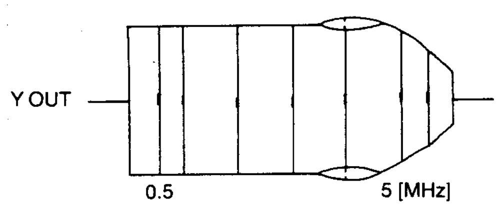
Adjust VR26 as shown figure.
IC31 - 1pin ---> Centre between maximum DC and minimum DC at TP7.



4-19. Y AUTO EQ FREQUENCY ADJ.

(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Y OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ⁚⁚ TAPE 60% SWEEP PORTION	WFM MONITOR	----------	VR24(AUTO EQ PRESET) VR25(AUTO EQ BAL) Y PB EQ (Pull Out Drawer)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Machine Condition	PB EQ SW : AUTO Y PB EQ : Centre Click Position (Pull Out Drawer)
Step 2. Adjust VR25 so that the channel balance is balanced.	Channel Balance → Balanced 
Step 3. Adjust VR24 so that the frequency characteristic is same as manual EQ.	Frequency Response → As same as manual EQ 
Step 4. Confirm the frequency response smoothly by turning the Y PB EQ on the Pull Out Drawer.	⊘ Y PB EQ  0.5~5 MHz 100±5%

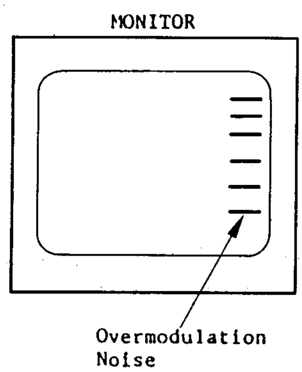
Step 5. Confirm that the frequency response is in a specification.	SPEC REF : 500KHz 1MHz : 95 ~ 105% 2MHz : 94 ~ 104% 3MHz : 92 ~ 103% 4MHz : 91 ~ 102% 5MHz : 90 ~ 101%

4-20.Y OVERMODULATION CONFIRMATION

(S4 Y PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO 2 OUT	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE 100% MULTI BUTST Recorded by AU-650B		----------	---------------

ADJUSTMENT PROCEDURE & SPECIFICATION

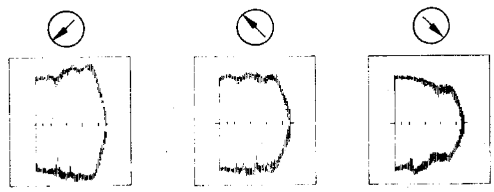
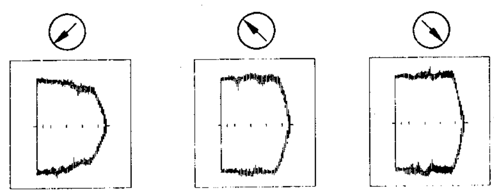
Step 1. Overmodulation ---> Not appeared on the monitor TV.	
Step 2. If appear the overmodulation noise, head erase or EQ re-adjustment is necessary.	

5. C PB SECTION (S3)

5-1. C PB EQ TERMINATION ADJUSTMENT

(S3 C PB)

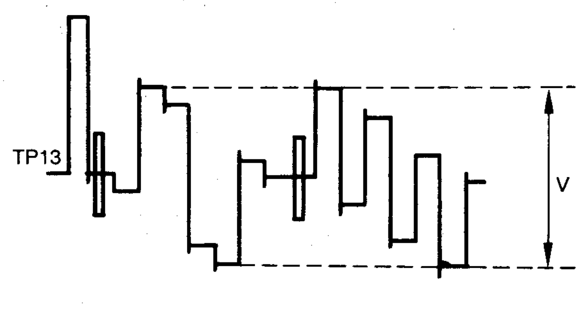
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Pb, Pr OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ☐ TAPE 60% COLOUR BAR PORTION	WFM MONITOR	----------	VR3 (TERM 1) VR4 (TERM 2)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Set the VR3 (TERM 1) at 11:30 o'clock position. Confirm that the frequency characteristic is flat. If it is not, adjust VR3 so that the frequency characteristic is flat.	VR3 (TERM 1) ---> 11:30 o'clock  NG GOOD NG
Step 2. Set the VR1 (TERM 2) at 12:00 o'clock position. Confirm that the frequency characteristic is flat. If it is not, adjust VR4 so that the frequency characteristic is flat.	VR4 (TERM 2) ---> 12:00 o' clock  NG GOOD NG

5-2. C DE-EMP LEVEL ADJUSTMENT

(S3 C PB)

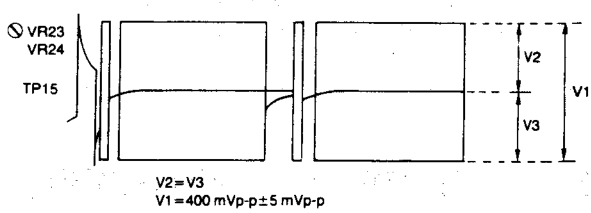
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP13	PLAY	BLANK ☐ TAPE ALIGNMENT ☐ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR21 (NL LEV.)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR21 as shown figure.	 SPEC V = 1.1 ± 0.01Vp-p

5-3. C LIM LEVEL ADJUSTMENT

(S3 C PB)

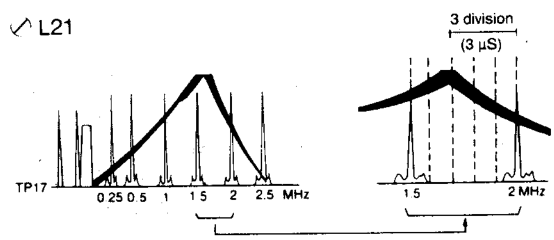
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP15 TP16 (for TRIGGER)	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 100% BOWTIE PORTION	OSCILLO SCOPE	-----------	VR23 (NL LIM LEV.) VR24 (NL LIM BAL.)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Adjust VR24 as shown figure. V2 and V3 level ---> Balanced	
Step 2. Adjust VR23 as shown figure. V1, V2 and V3 level ---> In a spec.	

5-4. C 3.375MHz BPF ADJUSTMENT

(S3 C PB)

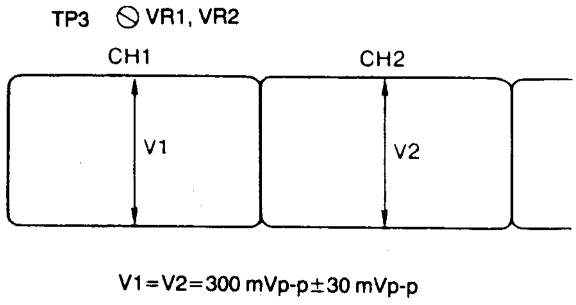
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP17	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 60% SWEEP Recorded by AU-650B	OSCILLO SCOPE	----------	L21

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. OSCILLOSCOPE SETTING DELAY Mode by 1us/div beetween 1.5MHz and 2MHz Portion.	
Step 2. Adjust L21 as shown figure.	

5-5. C PB RF LEVEL ADJUSTMENT (1)

(S3 C PB)

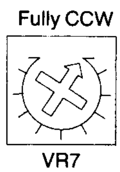
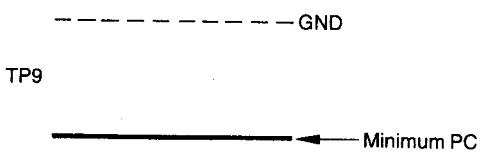
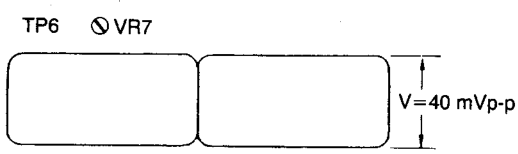
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP 3	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	---------	VR1 (AT RF LEVEL)

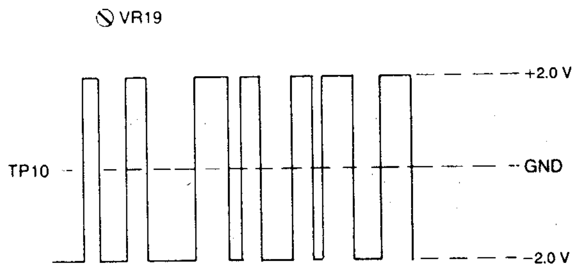
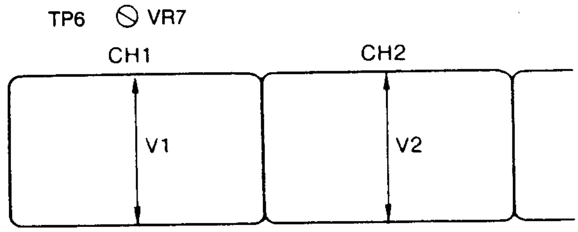
ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR1 as shown figure.	

5-6. C DOC LEVEL ADJUSTMENT

(S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP6 TP9 TP10	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR7 (V-V RF LEVEL) VR19 (DE DET LEV) VR20 (DE DET BAL)

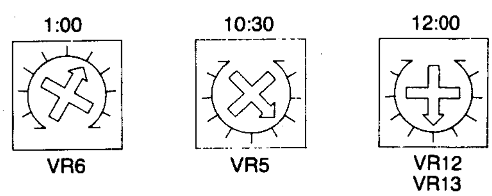
ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Adjust VR7 as shown figure.	
Step 2. Playing back the colour bar portion. DC level ---> Minimum	
Step 3. Adjust VR7 as shown figure.	

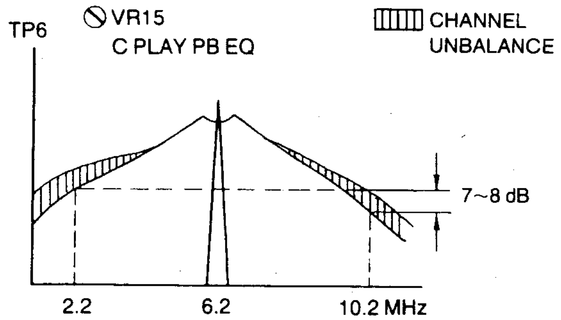
Step 4. Adjust VR19 as shown figure.	
Step 5. Adjust VR7 as shown figure.	 V1=V2=300 mVp-p±30 mVp-p

5-7. C PB EQ ADJUSTMENT

If spectrum analyzer is available. (S3 C PB)

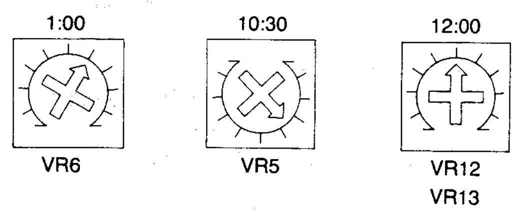
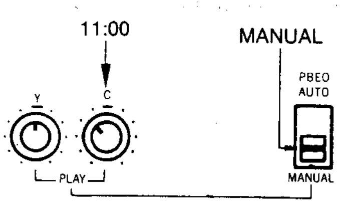
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP6	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 60% SWEEP PORTION	SPECTRUM ANALYZER	----------	VR5 (EQ4) VR6 (EQ3) VR12 (EQ1 AT CH1) VR13 (EQ1 AT CH2) VR15 (EQ2 AT BAL)

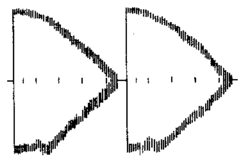
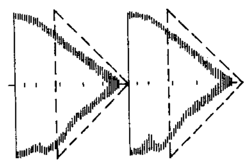
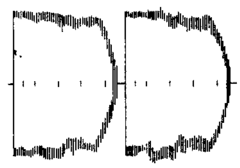
ADJUSTMENT PROCEDURE & SPECIFICATION	
If the spectrum analyzer is available.	
Step 1. Set the spectrum analyzer.	CENT FREQ : 6.2MHz SPAN : 10MHz REF : -22dB SHIFT : 5dB BAND : 100KHz VIDEO BAND : 300KHz SWEEP TIME : 5sec
Step 2. Set the position of VRs.	

Step 3. Adjust VR15 and C PB EQ as shown below. Channel balance ---> VR15 side band ratio ---> C PB EQ	

C PB EQ ADJ.
If spectrum analyzer is not available. (S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Pb, Pr OUT	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 60% SWEEP PORTION	WFM MONITOR	----------	VR3 (TERM 1) VR4 (TERM 2) VR5 (EQ 4) VR6 (EQ 3) VR12 (EQ 1 AT CH1) VR13 (EQ 1 AT CH2) VR15 (EQ 2 AT BAL) C PB EQ (Front Sub)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. VR Setting 1. Set the position of VRs.	
Step 2. VR Setting 2. Adjust C PB EQ as shown figure.	

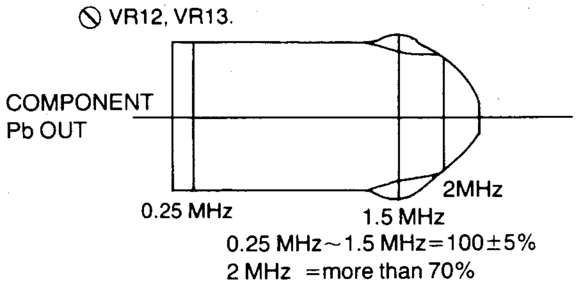
Step 3. Adjust VR13, VR14 as shown figure. VR13, 14 ---> Fully CCW	
Step 4. Adjust VR3, VR4 so that the frequency characteristic is shown figure.	**Make a triagnle waveform** 
Step 5. Adjust VR13, VR14 as shown figure.	**Make a flat waveform** 

5-8. C PB FREQUENCY ADJUSTMENT

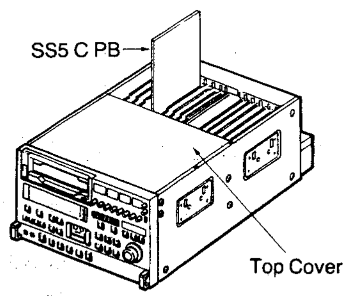
(S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Pb, Pr OUT	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 60% SWEEP PORTION	WFM MONITOR	----------	VR5 (EQ 4) VR12 (EQ 1 AT CH1) VR13 (EQ 1 AT CH2)

<table>
<tr><th colspan="2">ADJUSTMENT PROCEDURE & SPECIFICATION</th></tr>
<tr><td>Step 1.

Adjust VR12, VR13 as shown figure.</td><td>
</td></tr>
<tr><td>Step 2.

Confirm that the frequency response is in a specification.</td><td>SPEC.
REF : 500KHz
1.0MHz : 94 ~ 104%
1.5MHz : 93 ~ 103%
1.8MHz : 91 ~ 102%
2.0MHz : more than 63%</td></tr>
<tr><td>Note :

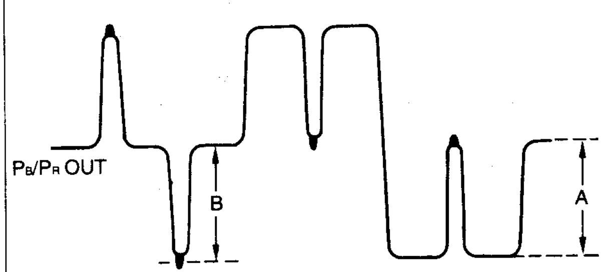
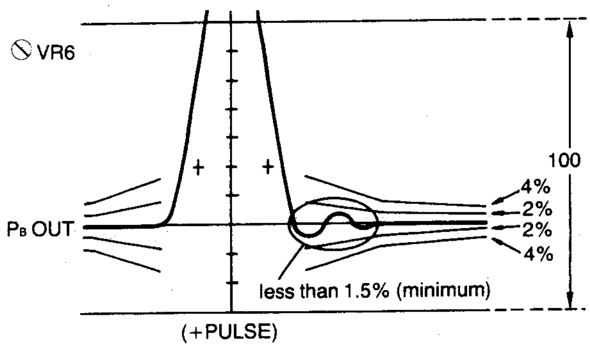
It should be better to cover the half of top by top panel while adjusting.</td><td>
</td></tr>
</table>

5-9. C K-FACTOR ADJUSTMENT

(S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Pb, Pr OUT	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE SIN2 2T Recorded by AU-650B	WFM MONITOR	----------	VR6 (EQ 3)

ADJUSTMENT PROCEDURE & SPECIFICATION

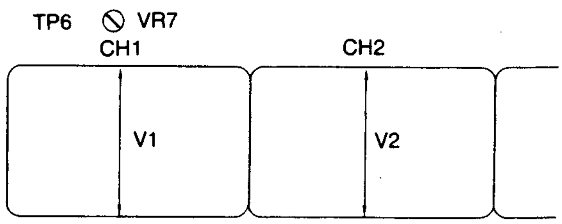
Step 1. Confirm KA of - Pulse	
Step 2. Confirm Kp of + Pulse	

Step 3.	Note 1 :
If out of spec ---> Adjust VR6 (EQ 3)	If adjust VR6, frequency response confirmation is necessary. Note 2 : Measure the cetre portion of Noise · Moire while adjusting.

5-10.C PB RF LEVEL ADJUSTMENT

(S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
		☐ BLANK TAPE			
TP6	PLAY	■ ALIGNMENT TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	-----------	VR7 (V-V RF LEV)

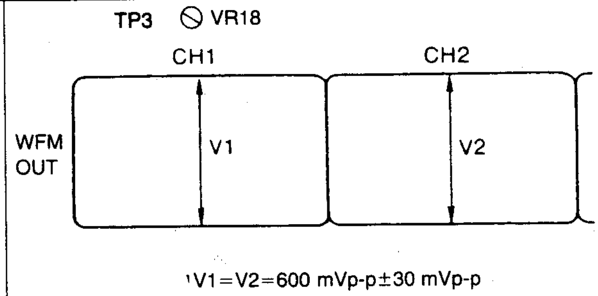
ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR7 as shown figure.	 V1=V2=300±30 mVp-p

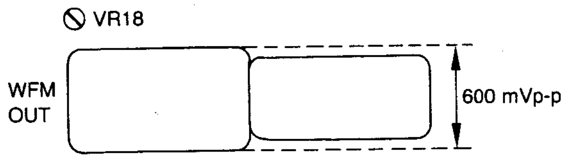
5-11.C WFM RF LEVEL ADJUSTMENT

(S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
		☐ BLANK TAPE			
WFM OUT (C RF)	PLAY	■ ALIGNMENT TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR18 (WFM RF LEV)

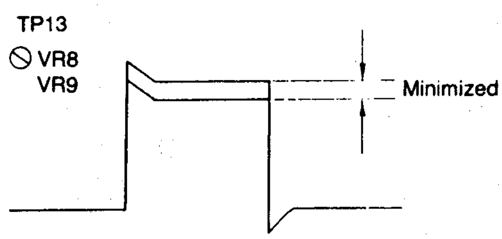
<table>
<tr><th colspan="2">ADJUSTMENT PROCEDURE & SPECIFICATION</th></tr>
<tr><td>Step 1.

Adjust VR18 as shown figure.</td><td>
</td></tr>
<tr><td>Step 2.

If there is a channel difference, RF level should be adjusted at average level between CH1 and CH2.</td><td>
</td></tr>
</table>

5-12.C CARRIER BALANCE ADJUSTMENT

(S3 C PB)

<table>
<tr><th>TEST POINT</th><th>MODE</th><th>TAPE USED</th><th>M.EQ.</th><th>INPUT SIGNAL</th><th>ADJUSTMENT</th></tr>
<tr><td rowspan="2">TP13</td><td rowspan="2">PLAY</td><td>□ BLANK TAPE</td><td rowspan="2">OSCILLO SCOPE</td><td rowspan="2">-----------</td><td rowspan="2">VR8 (LIMIT BAL)
VR9 (DEMOD BAL)</td></tr>
<tr><td>■ ALIGNMENT TAPE
100% COLOUR BAR PORTION</td></tr>
<tr><th colspan="6">ADJUSTMENT PROCEDURE & SPECIFICATION</th></tr>
<tr><td colspan="3">Adjust VR8 and VR9 as shown figure.</td><td colspan="3">
</td></tr>
</table>

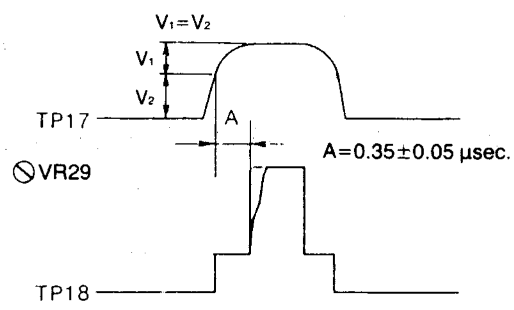
5-13.C S/H PULSE ADJUSTMENT

(S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP17 TP18	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 60% SWEEP PORTION	OSCILLO SCOPE	----------	VR29 (BURST S/H POS)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR29 as shown figure.

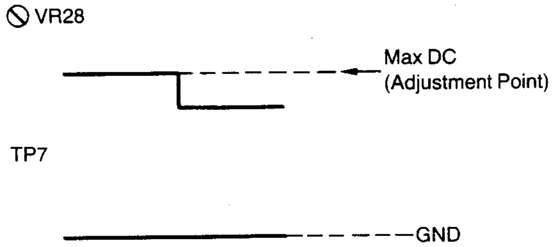


OSCILLO : 0.5usec DELAY

5-14.C AUTO EQ LIMITER ADJUSTMENT

(S3 C PB)

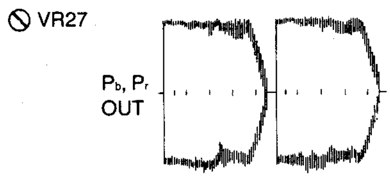
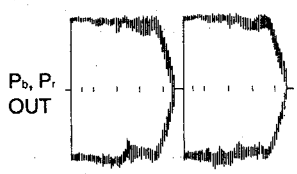
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP7 IC29 - 1pin	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 60% SWEEP PORTION	OSCILLO SCOPE	----------	VR28 (AUTO EQ LIM)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Mesure the maximum DC at TP7 while playback.	
Step 2. Adjust VR28 as shown figure.	

5-15.C AUTO EQ FREQUENCY ADJUSTMENT

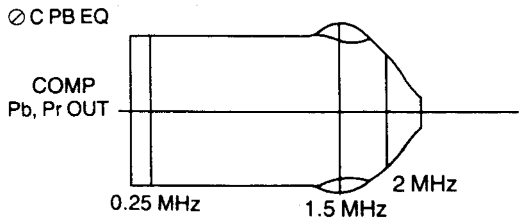
(S3 C PB)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Pb, Pr OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 60% SWEEP PORTION	WFM MONITOR	----------	VR26 (AUTO EQ PRESET) VR27 (AUTO EQ BAL) C PB EQ (Pull Out Drawer)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Machine Condition	PB EQ SW ---> AUTO C PB EQ (Pull Out Drawer) ---> Centre Click Position
Step 2. Adjust VR27 so that the channel balance is balanced.	
Step 3. Adjust VR26 so that the frequency characteristics is same as manual EQ.	

Step 4.

Confirm the frequency response smoothly by turning the C PB EQ on the Pull Out Drawer.



0.25~1.5 MHz=100%±5%
2.0 MHz=more than 70%

Step 5.

Confirm that the frequency response is in a specification.

SPEC.

REF	:	500KHz
1MHz	:	94 ~ 104%
1.5MHz	:	92 ~ 103%
1.8MHZ	:	91 ~ 102%
2.0MHz	:	more than 63%

5-16.C OVERMODULATION CONFIRMATION

(S3 C PB)

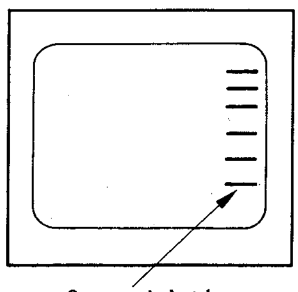
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Pb, Pr OUT	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 100% MULTI BURST RECORDED BY AU-650B	-------	-----------	----------------

ADJUSTMENT PROCEDURE & SPECIFICATION

Confirm that the overmodulation is not appearod on the monitor.

If appear the overmodulation, head erase or EQ re-adjustment is necessary.

MONITOR



Overmodulation Noise

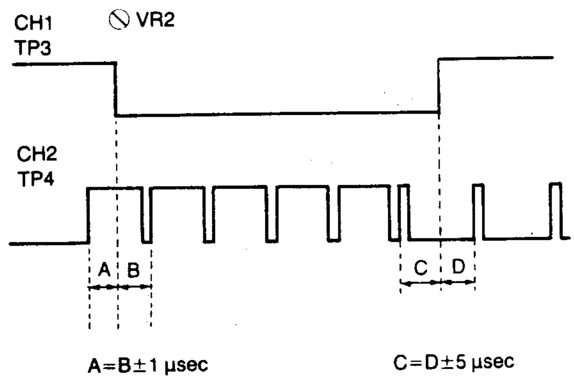
6. TBC 2 SECTION (L2)

6-1. VERTICAL SYNC SEPARATOR ADJUSTMENT (L2 TBC 2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP3 TP4	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	OSCILLO SCOPE	--------	VR2(V SYNC)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR2 as shown in figure.

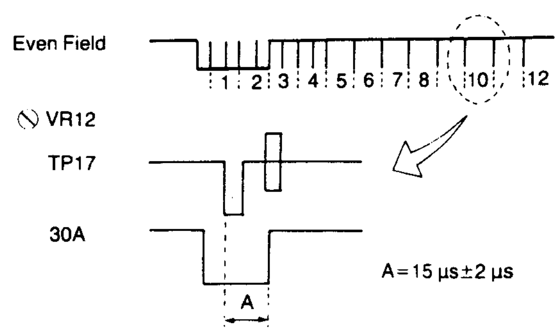


6-2. Y/C SEARCH VCO ADJUSTMENT (L2 TBC 2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP17 L2M30A	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR12(Y OFS)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust as shown in figure.



6-3. AFC ADJUSTMENT

(L2 TBC 2)

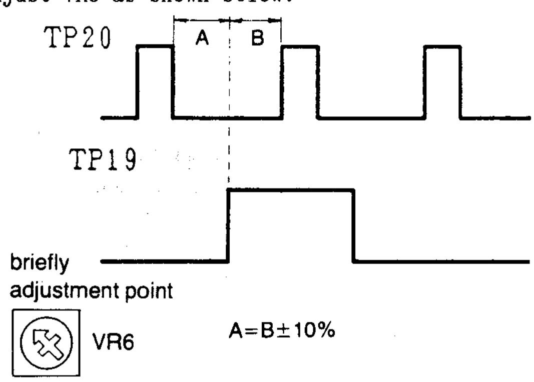
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP11	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	D.V.M.	------	L11

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP11=3.5V (+/-0.1VDC)	L11

6-4. Y BURST SEPARATOR ADJUSTMENT

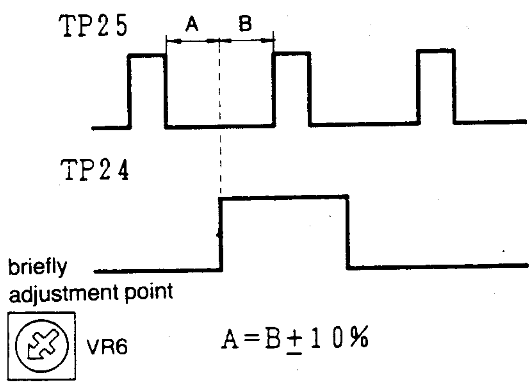
(L2 TBC 2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP4 TP19 TP20	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	--------	VR3 (Y SYNC PHASE)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Remove the socket of SW1,and connect the external trigger on the scope to TP4.	Adjust VR3 as shown below. 

6-5. C BURST SEPARATOR ADJUSTMENT (L2 TBC 2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP10 TP24 TP25	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR6 (CB PHASE)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR6 as shown in figure (Trigger the scope from TP10)	

6-6. Y APC ADJUSTMENT (L2 TBC 2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP12	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR8(Y APC)

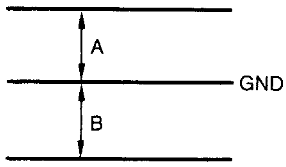
ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR8 as shown in figure.	

6-7. C APC ADJUSTMENT (L2 TBC 2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP13	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR11(C APC)

ADJUSTMENT PROCEDURE & SPECIFICATION

Turn VR11 to fully clockwise.
Adjust VR11 so that the pulse width,A and B are the same.



VR11

A=B

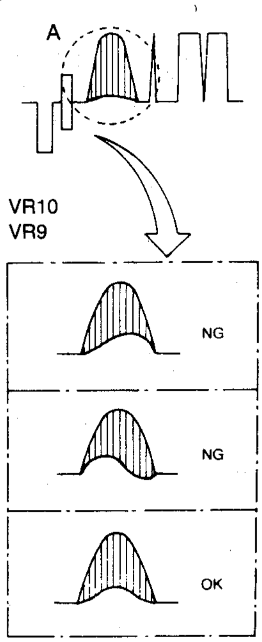
SCOPE=AC MODE

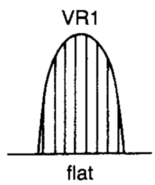
6-8. Y/C TIMING ADJUSTMENT

(L2 TBC 2)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO 1 OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE Y/C TIMING PORTION (20 T)	WAVEFORM MONITOR	------	VR10(PB PHASE) VR9(PR PHASE) VR1(Y/C TIMING) on the sub front panel

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Set VR9 and VR10 to centre position. Playback the Y/C TIMING (20 T) portion.	Adjust VR1 so that the A portion is flat as shown in figure.
Step 2 Playback the Y/C TIMING (20 T) portion. Adjust VR9 as shown in figure. Playback the Y/C TIMING (20 T) portion. Adjust VR10 as shown in figure.	(figures below)





7. ENCODER SECTION (L3)

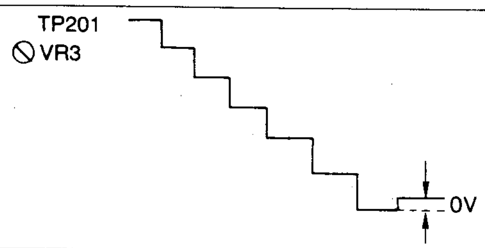
7-1. Y A/D PEDESTAL ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP201	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	---------	VR3 (Y REF)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR3 as shown figure.



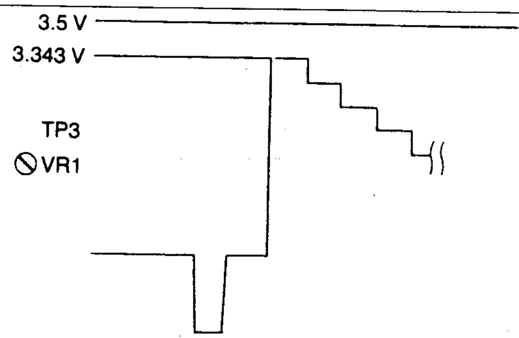
7-2. Y A/D INPUT LEVEL ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP3 (on the search sub P.C.B)	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR1(Y/G)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR1 as shown in figure.



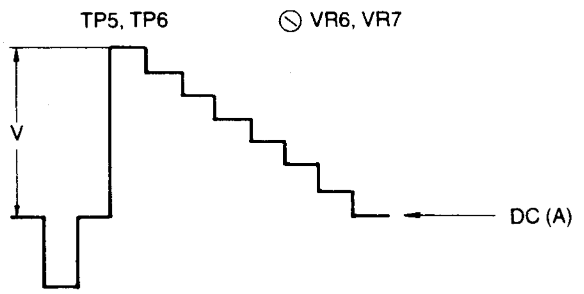
7-3. SEARCH VIDEO LEVEL ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP5 TP6	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	-----	VR6 (SEARCH REF) VR7 (SEARCH DC)

ADJUSTMENT PROCEDURE & SPECIFICATION

Connect the scope CH1 to TP5 and CH2 to TP6.
Then set the scope to CHOP mode
Adjust VR6 so that the amplitude (v) is same level as shown in figure.
Adjust VR7 so that the pedestal levels (A) are same level,as shown in figure.

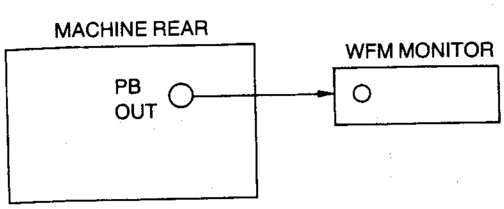


7-4. C A/D PEDDSTAL ADJUSTMENT

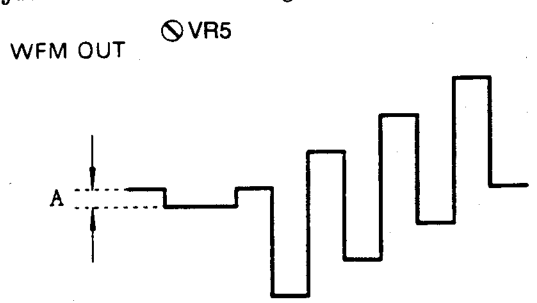
(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
COMPONENT PB OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	WAVEFORM MONITOR	-----	VR5(C REF)

ADJUSTMENT PROCEDURE & SPECIFICATION



Adjust VR5 as shown in figure



$A = 0 \pm 1\,mV$

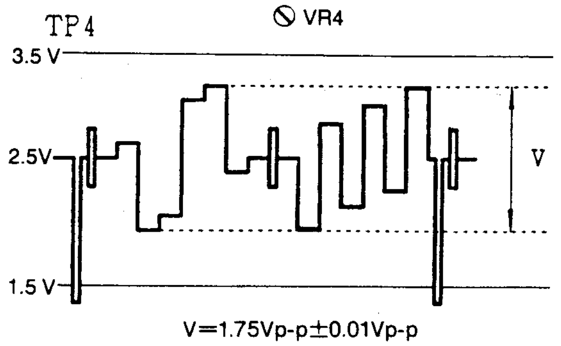
7-5. C A/D INPUT GAIN ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP4	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	---------	VR4 (C.G)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR4 as shown figure.



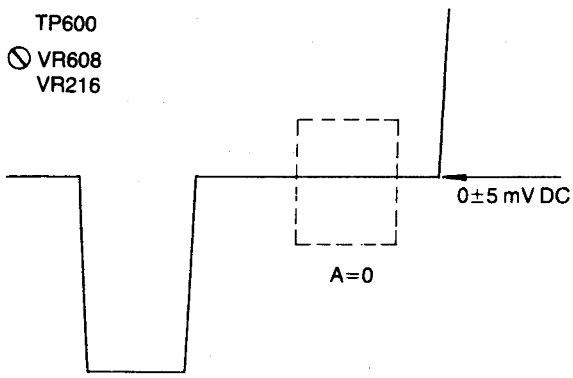
7-6. COMPONENT Y OUT BLANKING ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
COMPONENT Y OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	WAFMFORM MONITOR	---------	VR608 (Y BLK DC) VR216 (Y PED)

ADJUSTMENT PROCEDURE & SPECIFICATION

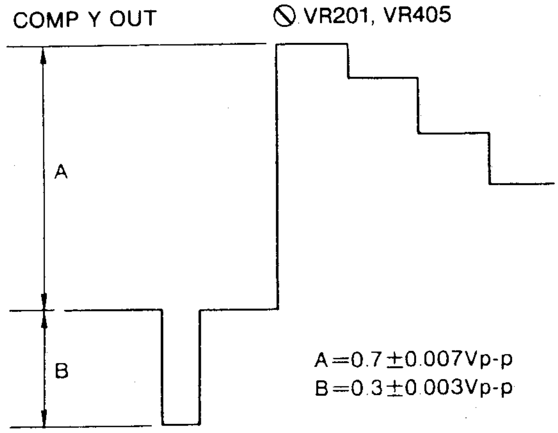
Adjust VR608 so that the blanking of composite sync is 0+/-5mVDC as shown in figure
Adjust VR216 so that the A portion is flat as shown in figure.



7-7. COMPONENT Y OUT LEVEL ADJUSTMENT (L3 ENCODER)

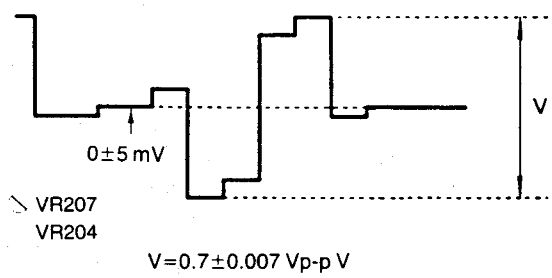
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
COMPONENT Y OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	WAVEFORM MONITOR	------	VR201(Y.G) VR405(SYNC.G)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Set the sync level VR on the pull out drawer to centre position and component Y level VR to centre position. Set the SW404 to ON.	Adjust VR201/VR405 as shown in figure.



7-8. COMPONENT PR OUT LEVEL ADJUSTMENT (L3 ENCODER)

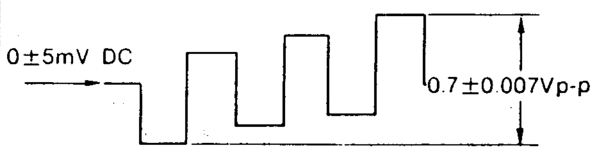
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP404 COMPONENT PR OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	WAVEFORM MONITOR SOCILLO SCOPE	---------	VR207 (PR.G) VR204 (V.DC)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Set the component Pr level on the pull out drawer to centre position. Connect the EXT SYNC of WFM MONITOR to component Y OUT and set the sync select switch of WFM monitor to EXT mode	Adjust VR207 as shown in figure. COMPONENT Pr OUT, TP404 
Step 2 Connect the scope to TP404	Adjust VR204 so that the blanking DC level is 0+/-5 mV

7-9. COMPONENT PB OUT LEVEL ADJUSTMENT

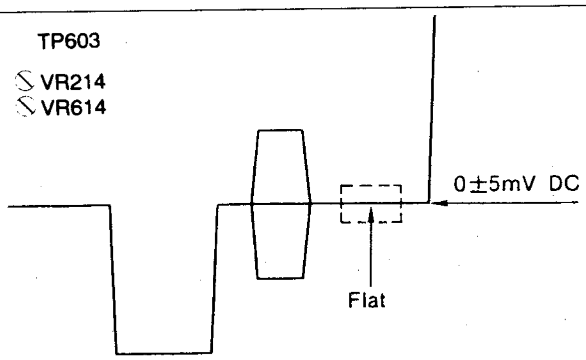
(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP406 COMPONENT PB OUT	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	WAVEFORM MONITOR OSCILLO SCOPE	----------	VR205 (PB.G) VR209 (V.DC)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Set the component Pb level on the pull out drawer to centre position. Connect the EXT SYNC of WFM MONITOR to component Y OUT and set the sync select switch of WFM monitor to EXT mode.	Adjust VR205 as shown in figure. COMP PB OUT ⦸ VR205, VR209 
Step 2. Connect the scope to TP406.	Adjust VR209 so that the blanking DC level is 0+/-5 mV

7-10. BLANKING DC ADJUSTMENT

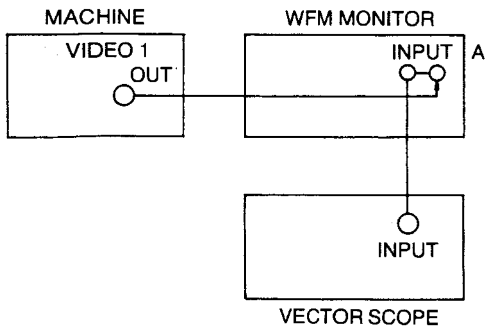
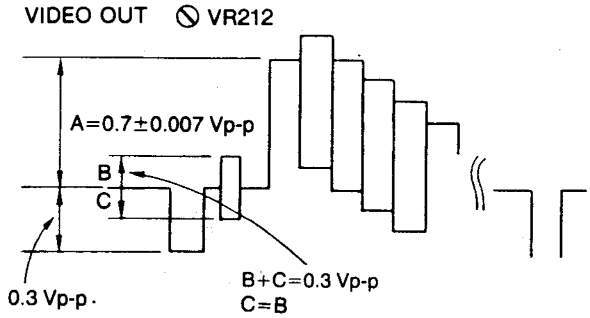
(L3 ENCODER)

<table>
<tr><th>TEST POINT</th><th>MODE</th><th>TAPE USED</th><th>M.EQ.</th><th>INPUT SIGNAL</th><th>ADJUSTMENT</th></tr>
<tr><td rowspan="2">TP603</td><td rowspan="2">PLAY</td><td>□ BLANK TAPE</td><td rowspan="2">WAVEFORM MONITOR</td><td rowspan="2">---------</td><td rowspan="2">VR614 (PAL, BLK, DC)
VR214 (PAL, DC)</td></tr>
<tr><td>■ ALIGNMENT TAPE COLOUR BAR PORTION</td></tr>
<tr><td colspan="6">ADJUSTMENT PROCEDURE & SPECIFICATION</td></tr>
<tr><td colspan="3">Adjust VR614/VR214 as shown figure.</td><td colspan="3">
</td></tr>
</table>

7-11. VIDEO 1 OUT LEVEL ADJUSTMENT

(L3 ENCODER)

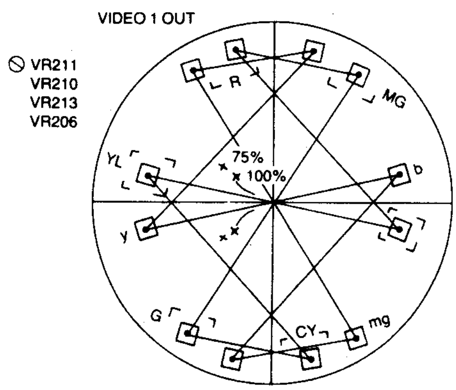
<table>
<tr><th>TEST POINT</th><th>MODE</th><th>TAPE USED</th><th>M.EQ.</th><th>INPUT SIGNAL</th><th>ADJUSTMENT</th></tr>
<tr><td rowspan="2">VIDEO 1 OUT</td><td rowspan="2">PLAY</td><td>□ BLANK TAPE</td><td rowspan="2">WAVEFORM MONITOR
VECTOR SCOPE</td><td rowspan="2">--------</td><td rowspan="2">VR212 (PAL.G)
VR603 (BURST.G)
VR613 (BURST.DC)</td></tr>
<tr><td>■ ALIGNMENT TAPE COLOUR BAR POSITION</td></tr>
</table>

ADJUSTMENT PROCEDURE & SPECIFICATION	
Set the video level VR and burst level VR on the pull out drawer to centre position.  	VIDEO OUT ⦸ VR212  BURST LEVEL --- VR603 (VECTOR SCOPE : 100%) VR613 (WAVEFORM MONITOR) VIDEO LEVEL --- VR212 (WAVEFORM MONITOR A=0.7±0.007Vp-p)

7-12.VIDEO 1 OUT CHROMA PHASE ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO I OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	VECTOR SCOPE	---------	VR210(QUAD) VR211(CHPOMA PHASE OFS) VR213(CG) VR206(U.V.BAL)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR206/VR210/VR211/VR213 so that the each vector level is in the scale of vector scope. VR211 --- Will change Pb and Pr phase VR210 --- Will change Pb phase VR213 --- Will change Pb and Pr level VR206 --- Will change Pr level	

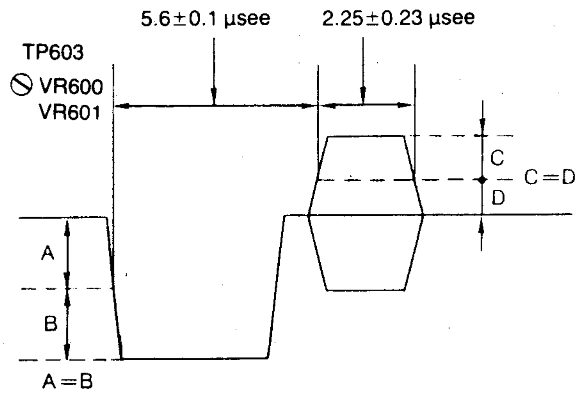
7-13.VIDEO 1 OUT BURST POSITION ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP603	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	OSCILLO SCOPE	---------	VR600 (BURST PHASE) VR601 (BF WID)

ADJUSTMENT PROCEDURE & SPECIFICATION

Adjust VR600/VR601 as shown figure.



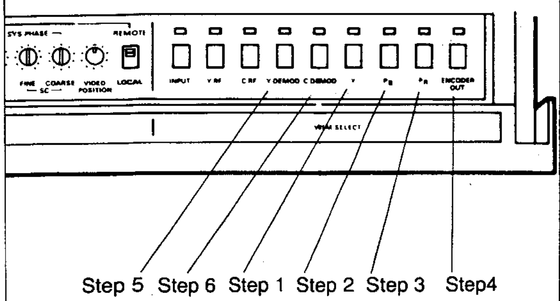
7-14.WFM OUT LEVEL ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
WFM OUT	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	WAVEFORM MONITOR	---------	VR609(WFM.Y.G) VR610(WFM.Pr.G) VR611(WFM.Pb.G) VR612(WFM.ENC.G) VR606(C DEM.G) VR607(Y DEM.G)

ADJUSTMENT PROCEDURE & SPECIFICATION

FRONT PULL OUT DRAWER



Step 1
Adjust VR609 so that the output level from sync tip to white level is 1Vp-p.

Step 2
Adjust VR610 so that the Pr level is 0.7Vp-p.

Step 3
Adjust VR611 so that the Pb level is 0.7Vp-p.

Step 4
Adjust VR612 so that the output level from sync tip to white level is 1Vp-p.

Step 5
Adjust VR607 so that the output level from sync tip to white level is 1Vp-p.

Step 6
Adjust VR606 so that the CTCM signal is 0.7Vp-p.

7-15. CHARACTER MIX LEVEL ADJUSTMENT

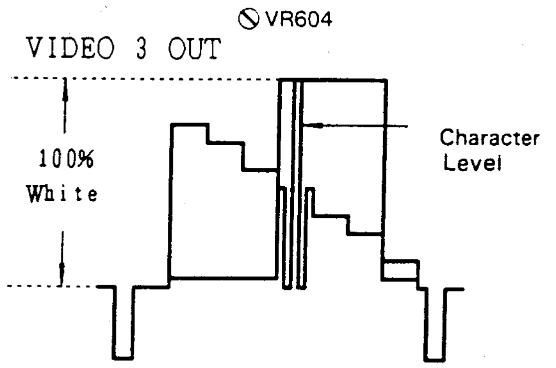
(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO OUT 3	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	WAVE FORM MONITOR	----------	VR604 (CHARA GAIN)

ADJUSTMENT PROCEDURE & SPECIFICATION

Set the SUPER switch on the sub front panel to ON.

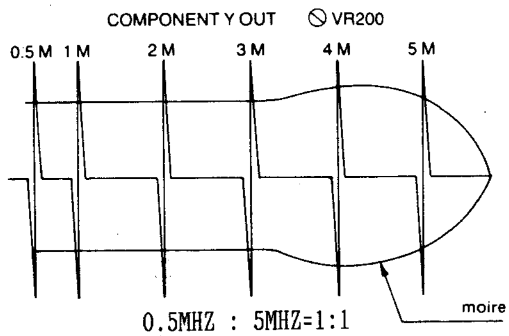
Adjust VR604 as shown in figure.



7-16. FREQUENCY RESPONSE ADJUSTMENT

(L3 ENCODER)

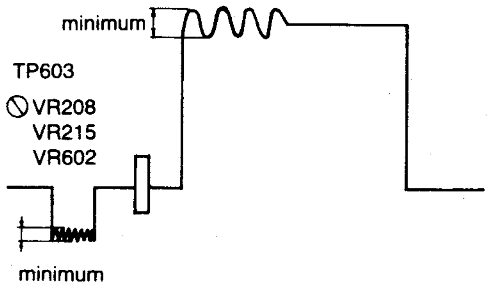
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
COMPONENT Y OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 60% SWEEP SIGNAL 60% SWEEP SIGNAL RECORDED BY AU-650B	WAVEFORM MONITOR	----------	VR200 (F ADJ)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR200 as shown figure.	

7-17. SC LEAK ADJUSTMENT

(L3 ENCODER)

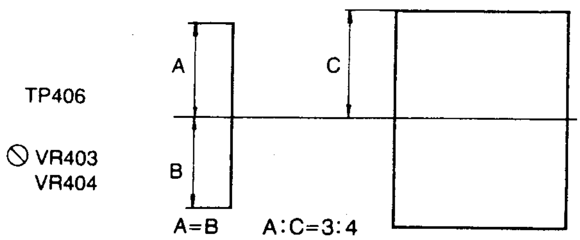
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP603 VIDEO 1 OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 50% FLAT SIGNAL RECORDED BY AU-650B	OSCILLO SCOPE	--------	VR208(Pr BAL) VR215(Pb BAL) VR602(BURST BAL)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR208, VR215, VR602 as shown figure.	

7-18.COMPONENT CF LEVEL ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP406	PLAY	☐ BLANK TAPE ■ ALIGNMENT TAPE COLOUR BAR PORTION	OSCILLO SCOPE	---------	VR403 (ID BAL) VR404 (ID LEVEL)

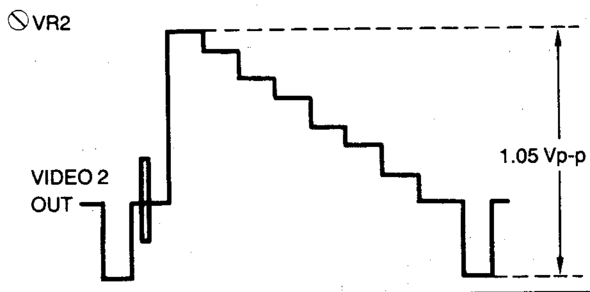
ADJUSTMENT PROCEDURE & SPECIFICATION	
Set the SW403 to right side.	Adjust VR403 so that the A and B leve is the same as shown below  Adjust VR404 so that the A level is 0.75C

7-19. Y AGC GAIN ADJUSTMENT

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO 2 OUT	FF	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	-----	VR 2 (AGC,G)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Adjust VR2 so that the output level is shown in figure.	



7-20. Y/C TIMING ADJUSTMENT

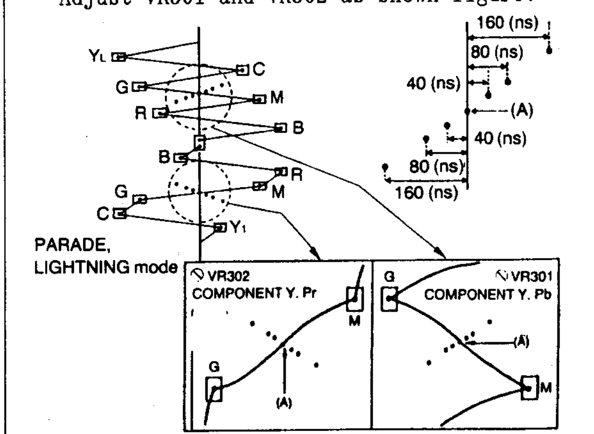
(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
COMPONENT Y Pr Pb OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	WFM 300	----------	VR301 (Pb) VR302 (Pr)

ADJUSTMENT PROCEDURE & SPECIFICATION

- Connect the CH1 of WFM-300 to COMPONENT Y out, CH2 to Pb out and CH3 to Pr out on the rear panel.
- Set the WFM-300 to PARADE and LIGHTING mode.

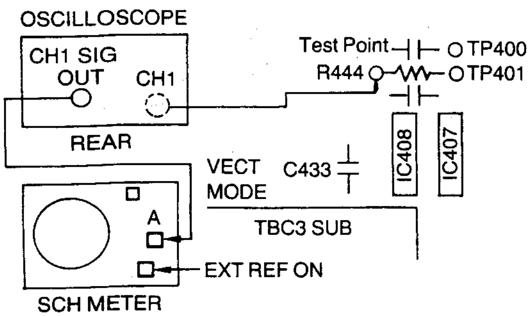
Adjust VR301 and VR302 as shown figure.

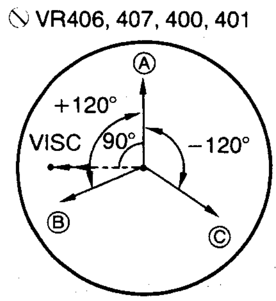


7-21.VISC ADJUSTMENT (1)

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
Left side of R444. Pin 3, 4 and 8 of VISC sub P.C.Board (VEP88041A)	EJECT PLAY	☐ BLANK TAPE ■ PRE-RECORD TAPE WHICH IS INCLUDED OF CF SIGNAL	SCH METER OSCILLO SCOPE	REF VIDEO IN :COLOUR BAR (SCH : 0°)	VR406 (VISC 01) VR407 (VISC 02) VR400 (SC ADJ 1)

<table>
<tr><th colspan="2">ADJUSTMENT PROCEDURE & SPECIFICATION</th></tr>
<tr><td>Step 1.
·CAPSTAN LOCK SW : 8F MODE
·Connection as shown below.


</td><td>Set the phase control on the SCH meter to position A as shown below.


</td></tr>
<tr><td>Step 2.
·Connect the SCH meter to pin 4 of sub connector on the VISC sub P.C Board.</td><td>Adjust VR406 so that the phase becomes position B (+120°) as shown in figure.</td></tr>
<tr><td>Step 3.
·Connect the SCH meter to pin 3 of sub connector on the VISC sub P.C. Board.</td><td>Adjust VR406 so that the phase becomes position C (-120°) as shown in figure.</td></tr>
<tr><td>Step 4.
·PLAY MODE
·Connect the SCH meter to pin 8 of sub connector on the VISC sub P.C. Board.</td><td>Adjust VR407 and VR401 so that the two VISC components is matched as shown in figure (+90°)</td></tr>
</table>

7-22. VISC ADJUSTMENT (2)

(L3 ENCODER)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO 2 OUT Pin 1 of SW 402 Pin 2 of SW 402	EJECT	☐ BLANK TAPE ☐ ALIGNMENT TAPE	OSCILLO SCOPE	REF VIDEO IN :COLOUR BAR (SCH:Odegree)	VR402 (REF VOLT) SW402

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. ·CH1----Pin 1 of SW402 ·CH2----Pin 2 of SW402 ·SCOPE--DC MODE	Adjust VR402 so that the output levels are same.
Step 2 Connect the SCH meter to VIDEO 2 OUT. on the rear panel	Adjust VR402 so that the VISC signal is not move by changing the SW402 ON and OFF.

8. PB AMP AND FM AUDIO SECTION (S5)

8-1. HEAD AMP BALANCE ADJ.

(S5 PB AMP AND FM AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
		BLANK □ TAPE			
TP3 TP6	PLAY	ALIGNMENT ■ TAPE 100% COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR1 (Y MIX) VR2 (C MIX)

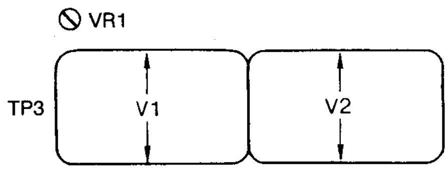
ADJUSTMENT PROCEDURE & SPECIFICATION

Step 1.

Adjust VR4, VR10 on the S9 AT2 PCB so that the RF level is maximum.

Step 2.

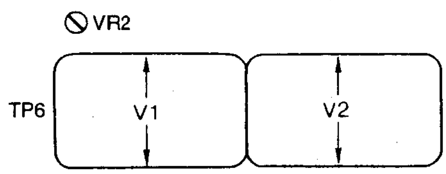
Adjust VR1 so that the RF level is balanced.



V1=V2=more than 200 mVp-p

Step 3.

Adjust VR2 so that the RF level is balanced.



V1=V2=more than 200 mVp-p

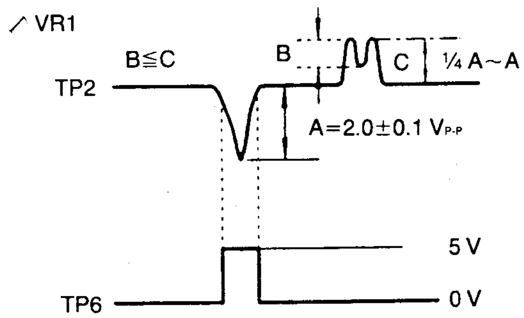
9. AT SECTION (S9)

NOTE:This adjustment requires mechanical interchangeability be correct before proceeding.

9-1. MR HEAD PLAYBACK AMP

(S9 AT)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP2 TP6	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR1 (MR GAIN)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Disconnect the P1 connector. Adjust VR1 as shown figure.	

9-2. MR PHASE SHIFTER ADJUSTMENT

(S9 AT)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP4 TP14	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	D.V.M	----------	VR2(MR PHAS SHIFTER)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Disconnect the P1 connector. AUTO/PRESET SW : PRESET Turn VR2 to fully counterclockwise.	·Slowly turn VR2 to clockwise,and adjust VR2 so that the output level at TP4 and TP12 become to OVDC ·Confirm that the D26 on the AT board is not illuminates.If it illuminate, readjust VR2.
Step 2 AUTO/PRESET SW:AUTO	

9-3. HIGH VOLTAGE ADJUSTMENT

(S9 AT)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP 33 TP 34	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE (use the probe of 1:100)	------	VR 20 (LEVEL)

ADJUSTMENT PROCEDURE & SPECIFICATION	
·Disconnect the P1 connector ·TP33=+500V+/-10VDC	VR 20

9-4. DRIVE AMP OFFSET ADJUSTMENT

(S9 AT)

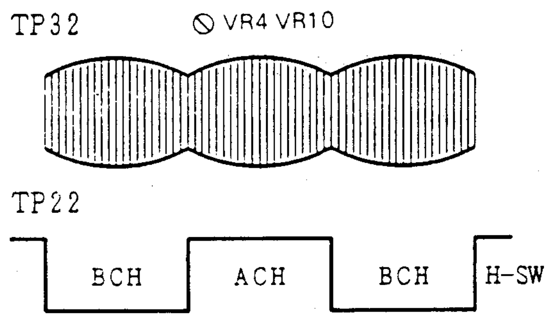
TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP10 TP18 TP29 TP30	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	D.V.M	---------	VR7 (OFF SET) VR8 (OFF SET)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. AUTO/PRESET SW : PRESET Disconnect the P1 connecter. Connect a jumper between TP 29 and GND. TP 10 = 0V(+/-0.3VDC)	VR 7
Step 2. Connect a jumper between TP30 and GND. TP 18 = 0V(+/-0.3VDC)	VR 8
Step 3. Remove the jumper AUTO/PRESET SW : AUTO Connect the P1 connector.	

9-5. X VALUE ADJUSTMENT

(S9 AT)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
		BLANK □ TAPE			
	PLAY	ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR4 (AX) VR10 (BX)

ADJUSTMENT PROCEDURE & SPECIFICATION	
AUTO/PRESET SW : PRESET Turn VR4 and VR10 to fully counter clockwise. Slowly turn the VR4 and VR10 to clockwise until the RF envelope is first maximum point as shown in figure.	 NOTE : This adjustment requires that mechanical interchangeability be correct before proceeding.

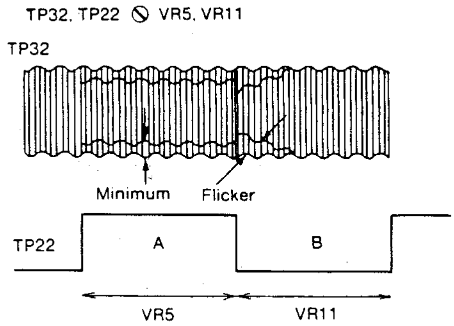
9-6. GAIN ADJUSTMENT (1)

(S9 AT)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
		BLANK □ TAPE			
TP32 TP22	VAR +30/32 *NOTE	ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR5 (A GAIN) VR11 (B GAIN)

<table>
<tr><th colspan="2">ADJUSTMENT PROCEDURE & SPECIFICATION</th></tr>
<tr>
<td>AUTO/PRESET SW : PRESET
Turn VR6 and VR12 to fully counter clockwise.
*Note : tape speed information can be superimposed onto the VIDEO OUT3 by SUPER switch on the front sub panel (L6 DIP SW SW 300-1 ON)

·After this adjustment,adjust VR6 and VR12.</td>
<td>Adjust VR5 and VR11 so that the RF envelope output level is flat.



</td>
</tr>
</table>

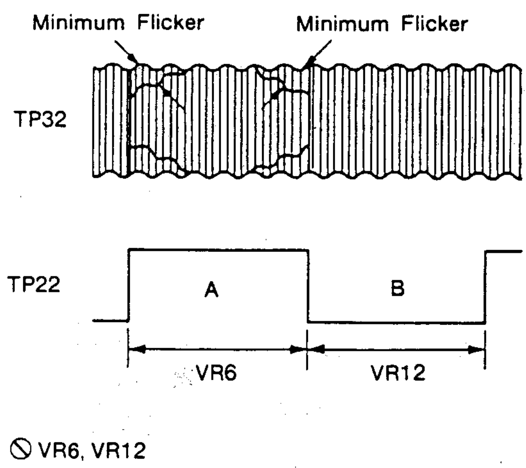
9-7. GAIN ADJUSTMENT (2)

(S9 AT)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP32	VAR X-1 *NOTE	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR6 (A COMP) VR12 (B COMP)

<table>
<tr><th colspan="2">ADJUSTMENT PROCEDURE & SPECIFICATION</th></tr>
<tr>
<td>Step 1
AUTO/PRESET SW : PRESET

*NOTE : Tape speed information can be superimposed onto the VIDEO OUT 3 by SUPER switch on the front sub panel. (L6 DIP SW300-1 ON)</td>
<td>Adjust VR6 and VR12 so that the RF envelope output level is flat.



</td>
</tr>
<tr>
<td>Step 2
·AUTO/PRESET SW : AUTO</td>
<td></td>
</tr>
</table>

9-8. RF ENVELOPE LEVEL ADJUSTMENT (S9 AT)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP24	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	------	VR3 (VR LEVEL)

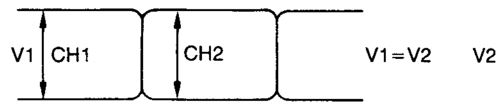
ADJUSTMENT PROCEDURE & SPECIFICATION	
AUTO/PRESET SW : PRESET	Adjust VR3 so that the maximum RF envelope level is 3.4V(+0,-0.2V)

10. FM AUDIO SECTION (S5)

10-1. PLAYBACK RF LEVEL ADJUSTMENT

(S5 FM AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP202	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	OSCILLO SCOPE	----------	VR4 (PB RF LEVEL)

ADJUSTMENT PROCEDURE & SPECIFICATION	
AUTO / PRESET SW : AUTO Adjust VR4 so that the CH1 and CH2 level is balanced.	

10-2. PLAYBACK LEVEL ADJUSTMENT

(S5 FM AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP201 TP301	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	VTVM	------	CH3 VR 202(PB LEVEL) VR 302(CH4 PB LEVEL)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP201(CH 3)=-22dBV(+/-0.2dB) TP301(CH 4)=-22dBV(+/-0.2dB)	VR 202 VR 302

10-3. PLAYBACK OUTPUT LEVEL ADJUSTMENT

(S5 FM AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
CH3 LINE OUT CH4 LINE OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 1KHz PORTION	VTVM	----------	VR201 (CH3 PB OUT) VR301 (CH4 PB OUT) VR6 (CH3 PB)on AUDIO VR Board VR8 (CH4 PB)on AUDIO VR Board

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. LINE OUT 1MP SW : HIGH (AUDIO MAIN P.C.B.) Pull the CH3 and CH4 play back level controls on the front panel and place in thir centre position. Connect the VTVM to CH3 LINE OUT.	Adjust VR716 to+0dBm
Step 2. Connect the VTVM to CH4 LINE OUT.	Adjust VR717 to +0dBm
Step 3. Push in the CH3 and CH4 play back level controls. Connect the VTVM to CH3 LINE OUT.	Adjust VR6 to +0dBm.
Step 4. Connect the VTVM to CH4 LINE OUT.	Adjust VR8 to +0dBm.

10-4. METER LEVEL ADJUSTMENT

(S5 FM AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
CH3 CH4 AUDIO METER	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 1KHz PORTION	AUDIO LEVEL METER (CH3, CH4)	----------	VR204 (CH3 METLEV) VR304 (CH4 METLEV)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Push in the CH3 and CH4 play back level controls Connect the VTVM to CH3 LINE OUT	Adjust VR204 to OVU
Step 2 Connect the VTVM to CH4 LINE OUT	Adjust VR304 to OVU

10-5. PEAK METER ADJUSTMENT

(S5 FM AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP3 TP4 CH3 CH4 AUDIO LEVEL METER	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 1KHz PORTION	VTVM D.V.M	----------	VR7 (LEVEL) VR8 (H1) VR9 (LOW) VR10 (LEVEL) VR12 (LOW)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Turn the VR8 and VR11 to fully counterclockwise. Turn the PB VR so that the output level is -8dBm(-19dBm:630-E) TP3=1.01V+/0.02VDC (0.79V+/-0.02VDC:630-E)	VR7
Step 2 TP4=1.0/V+/-0.02VDC (0.79V+/0.02VDC=630-E)	VR10
Step 3 Adjust VR9 and VR12 so that the level meter indicates 2 (-25dB:630-E)	
Step 4 Turn the PB VR so that the lavel is +8dBm (+6dB:630-E)	Adjust VR8 and VR11 so that the level meter indicates 6 (0dB:630-E)
Step 5 Turn the PB so that the output level is 0dBm.	Adjust VR9 and VR12 so that the level meter indicates 4. (-6dBm:630-E)

10-6. MONITOR OUTPUT LEVEL ADJUSTMENT

(S5 FM AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
MONITOR OUT CH3 CH4	PLAY	□ BLANK TAPE ■ ALIGNMENT TAPE 1KHZ PORTION	VTVM	---------	VR205 (CH3 MONI OUT) VR305 (CH4 MONI OUT)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 ·AUDIO MONITOR SW : FM & ST.MIX ·AUDIO MONITOR SW : OFF ·MONITOR OUT CH3=0dBm+/-0.2dBm	VR205
step 2 MONITOR OUT CH4=0dBm+/-0.2dBm Headphone VR:click position.	VR305

11. AUDIO SECTION (S6)

Note : Before adjustment of this section, Mechanical interchangeability adjustment is completed.

11-1. PLAYBACK EQ ADJUSTMENT

(S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
LINE OUT	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE FREQUENCY RESPONSE	VTVM	----------	VR101 (CH1 PB EQ) VR301 (CH2 PB EQ) SW101 SW301

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. Connect the VTVM to CH1 LINE OUT.	Adjust VR101 so that the level difference from 1fKHz to 15KHz is within ± 1dB.
Step 2. Connect the VTVM to CH2 LINE OUT.	Adjust VR301 so that the level difference from 1KHz to 15KHz is within ± 1dB.
Step 3. If it is not, change the position of SW102 and SW302, then repeat this adjustment.	NOTE : These switches are used for high frequency compensation. (7.5KHz ~ 15KHz)

11-2. PLAYBACK LEVEL ADJUSTMENT

(S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP101 TP301	PLAY LINE OUT 1MP SW : HIGH :	BLANK ☐ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	VTVM	----------	VR102 (CH1 PB GAIN) VR302 (CH2 PB GAIN)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP101=-6dBm+/-0.2dBm TP301=-6dBm+/-0.2dBm	VR102 VR302

11-3. OUTPUT LEVEL ADJUSTMENT

(S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
CH1 CH2 LINE OUT	PLAY LINE OUT ATT SW : MID	BLANK □ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	VTVM	----------	VR103 (CH1 LINE OUT) VR303 (CH2 LINE OUT) VR2 (CH1 OUT) Audio VR P.C.B. VR4 (CH2 OUT) Audio VR P.C.B.

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1. LINE OUT 1MP SW : HIGH (Audio main P.C.B) Pull the PB VR(CH1/CH2)on the front ponel and set the centre position. Connect the VTVM to CH1 LINE OUT.	Adjust VR103 to 0dBm ± 0.2dBm.
Step 2. Connect the VTVM to CH2 LINE OUT.	Adjust VR303 to 0dBm ± 0.2dBm.
Step 3 Push the PB VR(CH1/CH2).	Adjust VR2 and VR4 to 0dBm ± 0.2dBm.

11-4. EXT NR DECODE OUT LEVEL ADJUSTMENT

(S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP103 TP303	PLAY	BLANK □ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	VTVM	---------	VR105 (CH1 DEC OUT) VR305 (CH2 DEC OUT)

ADJUSTMENT PROCEDURE & SPECIFICATION	
TP103=0dBm+/-0.2dBm TP303=0dBm+/-0.2dBm	VR105 VR305

11-5. EXT NR DECODE IN LEVEL ADJUSTMENT

(S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP102 TP302	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	VTVM	----------	VR106 (CH1 DEC IN) VR306 (CH2 DEC IN)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 ·Short the 16pin connector between 2pin,3pin,12pin and 16pin ·Connect the VTVM to TP102 and measure the output level (A) ·Set the NR SW to EXT side	Adjust VR106 to A+/-0.2dBm
Step 2 ·Connect the VTVM to TP302 and measure the output level(B) ·Set the NR SW to EXT side	Adjust VR306 to B+/-0.2dBm
Step 3 ·Set the NR SW to INT side	

11-6. METER LEVEL ADJUSTMENT

(S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
CH1 CH2 AUDIO LEVEL METER	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	VTVM	----------	VR107 (CH1 METER) VR307 (CH2 METER)

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 Push in the CH1 and CH2 playback level controls CH1 AUDIO LEVEL METER=0dBm	VR107
Step 2 CH2 AUDIO LEVEL METER=0dBm	VR307

11-7. PEAK METER ADJUSTMENT

(S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
TP1 TP2 CH1 CH2 AUDIO LEVEL METER	PLAY	BLANK ☐ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	D.V.M. VTVM	------	VR1(LEVEL) VR2(HI) VR3(LOW) VR4(LEVEL) VR5(HI) VR6(LOW) on the PEAK METER P.C.B.

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 ·Turn the VR2 and VR5 to fully counter clockwise ·Pull the PB VR(cH1/cH2)on the front panel and adjust output level is -8dBm ·TP1=1.0/V+/-0.02VDC (630-E:-19dBm)	VR1
Step 2 (0.79V+/-0.02VDC:630-E) ·TP2=1.01V+/-0.02VDC (0.79V+/-0.02VDC:630-E)	VR4
Step 3 Adjust VR3 and VR6 so that the level meter indicates 2.(-25 dB:630-E)	
Step 4 ·Pull the PB VR on the front panel and adjust output level is +8dBm. (+6dBm:630-E)	Adjust VR2 and VR5 so that the level meter indicates 6. (0dB:630-E)
Step 5 ·Pull the PB VR on the front panel and adjust output level is 0dBm.	Adjust VR3 and VR6 so that the level meter indicates 4. (-6dB:630-E)

11-8. MONITOR OUT LEVEL ADJUSTMENT (S6 AUDIO)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
MONITOR OUT CH1 CH2	PLAY MONITOR OUT 1MP SW : HIGH	BLANK □ TAPE ALIGNMENT ■ TAPE 1KHZ PORTION	VTVM	----------	VR104 VR304

ADJUSTMENT PROCEDURE & SPECIFICATION	
Step 1 ·Audio MONITOR SW:LINER & STEREO ·AUDIO MONTOR SW:OFF ·Headphone VR:click position ·Monitor out CH1=0dBm+/-0.2dBm	VR104
Step 2 Monitor out CH2=0dbm+/-0.2dbm	VR304

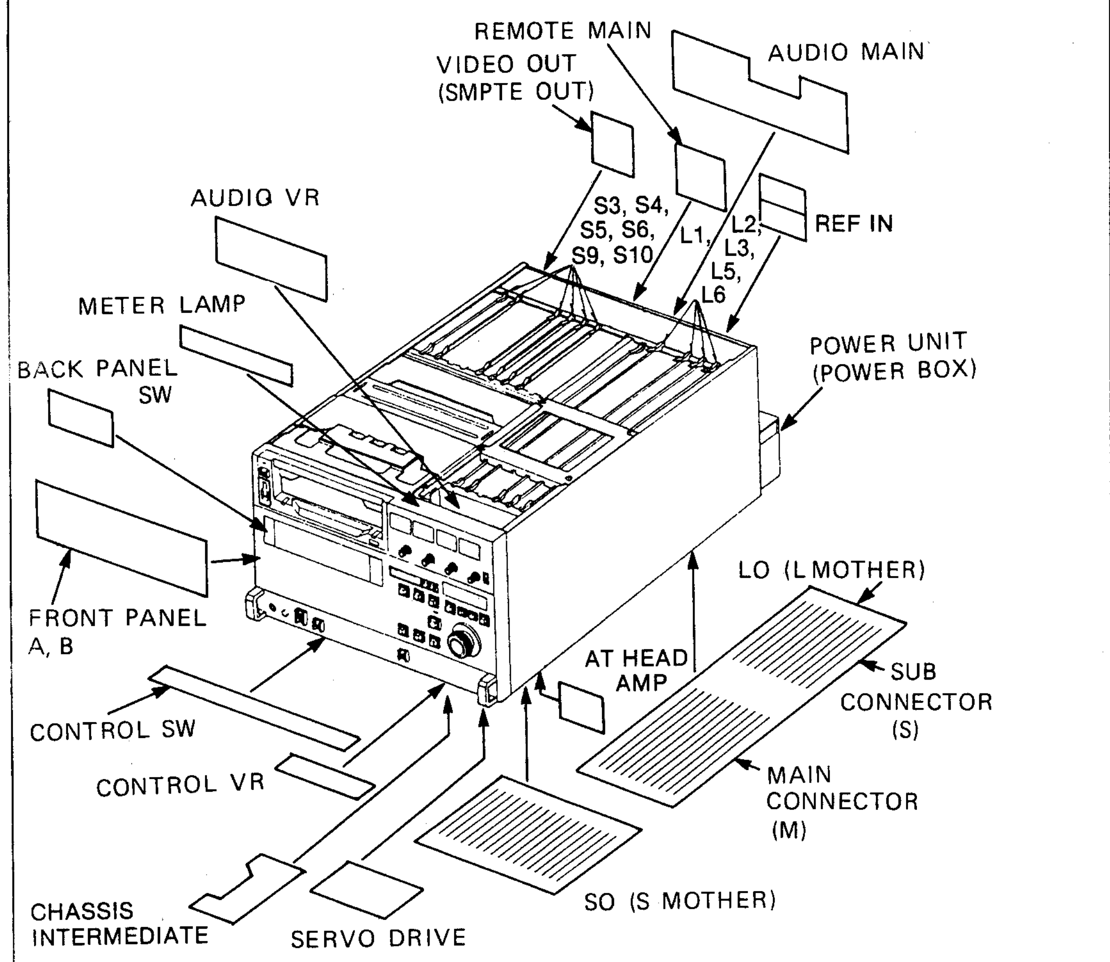
12. TIME CODE SECTION

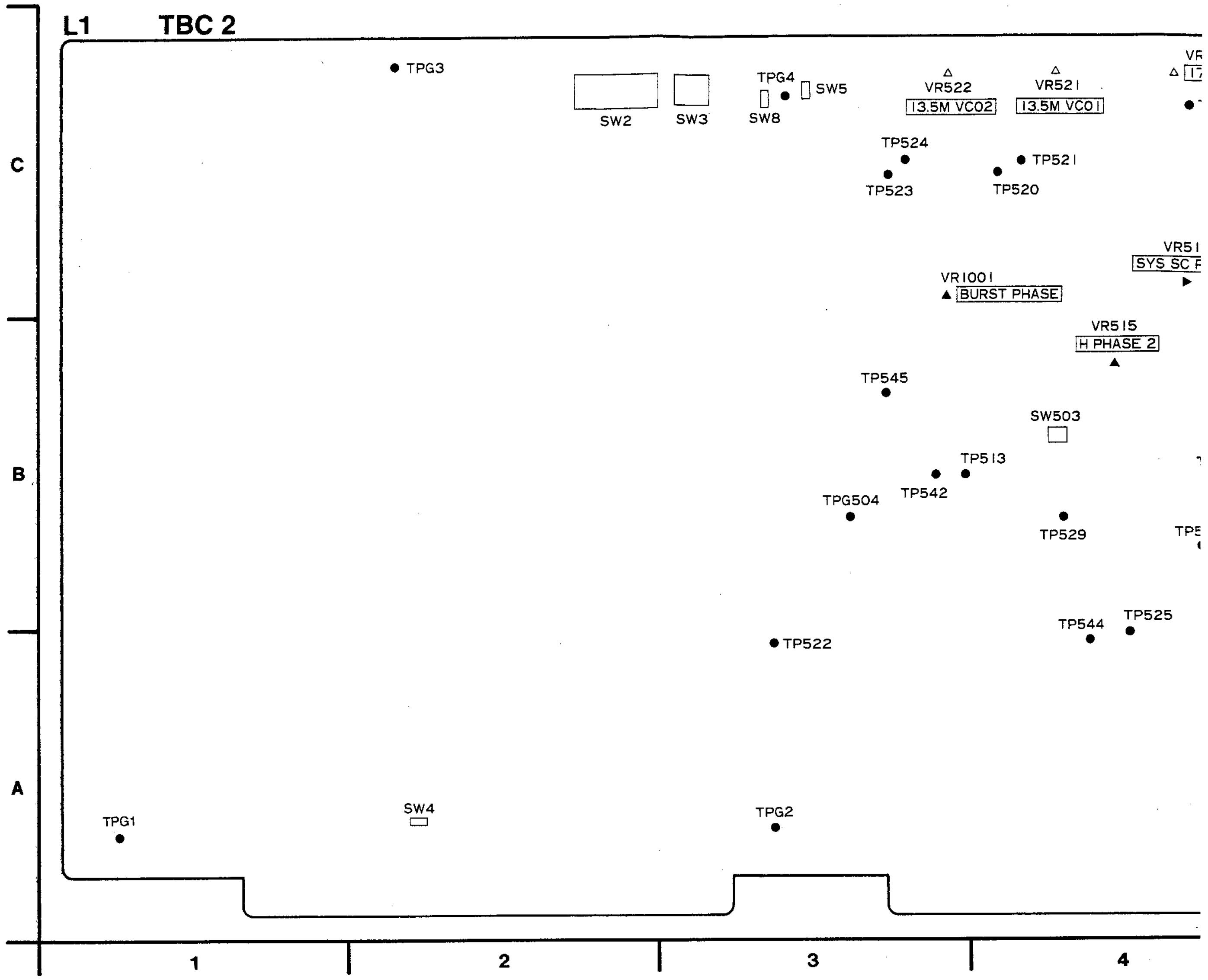
12-1. TIME CODE SUPER ADJUSTMENT . (L6 SYSCON & TC)

TEST POINT	MODE	TAPE USED	M.EQ.	INPUT SIGNAL	ADJUSTMENT
VIDEO OUT3	STOP	BLANK □ TAPE ALIGNMENT ■ TAPE COLOUR BAR PORTION	TV MONITOR	-----	VR301 (SUPER POS)

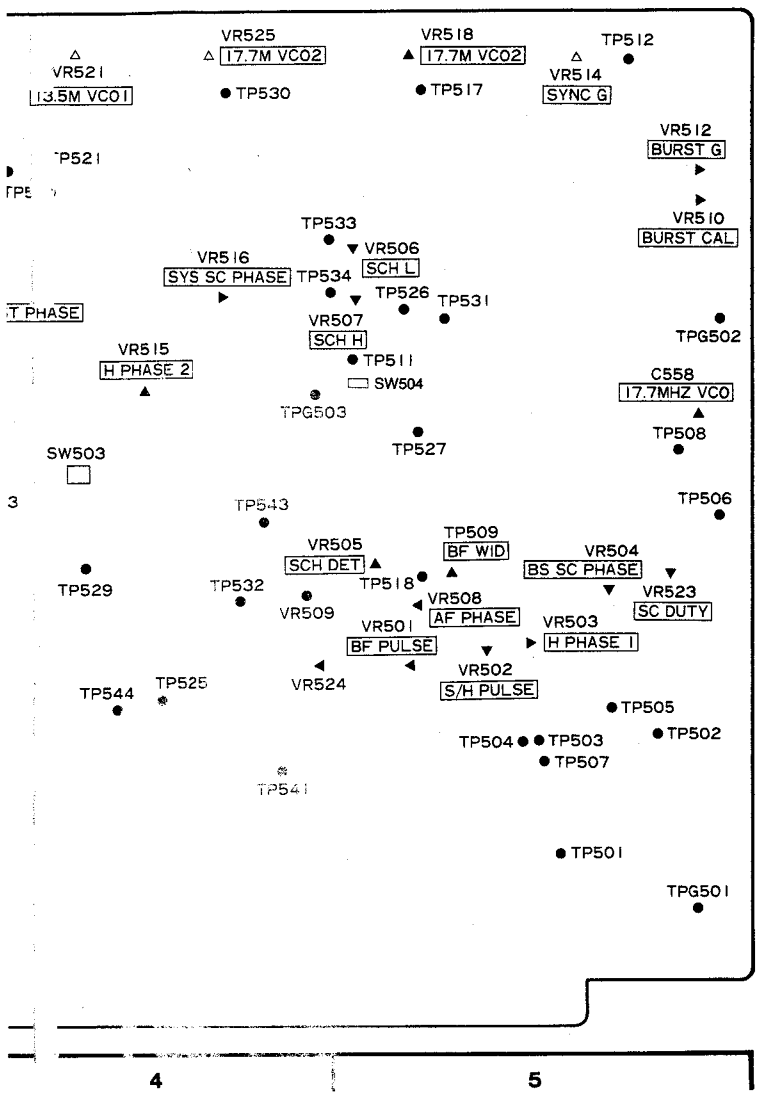
ADJUSTMENT PROCEDURE & SPECIFICATION	
·Connect the monitor to VIDEO OUT3. ·SUPER SW:ON	Adjust VR301 so that the indication is center position on the screen.

P.C. Board Location

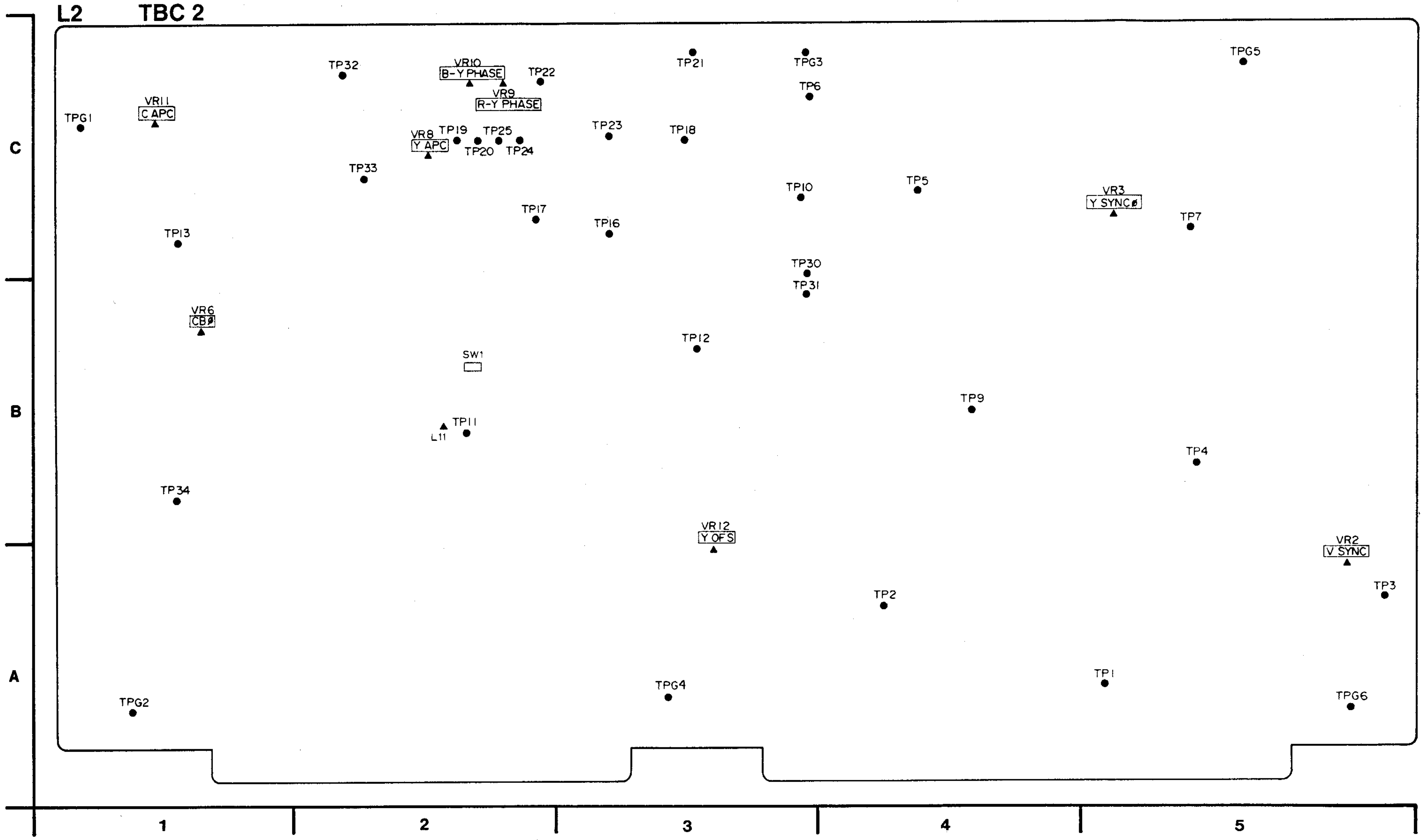




C	ADDRESS	SW	ADDRESS	TP	ADDRESS	TP	ADDRESS	TP	ADDRESS
C558	B-5	SW2	C-2	TP501	A-5	TP522	A-3	TP545	B-3
		SW3	C-3	TP502	A-5	TP523	C-3		
		SW4	A-2	TP503	A-5	TP524	C-3		
		SW5	C-3	TP504	A-5	TP525	A-4	TPG	ADDRESS
		SW8	C-3	TP505	A-5	TP526	C-5		
		SW503	B-4	TP506	B-5	TP527	B-5	TPG1	C-3
		SW504	B-5	TP507	A-5	TP529	B-4	TPG2	A-3
				TP508	B-5	TP530	C-4	TPG3	C-2
				TP509	B-4	TP531	C-5	TPG4	A-1
				TP511	B-5	TP532	B-4	TPG501	A-5
				TP512	C-5	TP533	C-4	TPG502	C-5
				TP513	B-3	TP534	C-4	TPG503	B-4
				TP517	C-5	TP541	A-4	TPG504	B-3
				TP518	B-5	TP542	B-3		
				TP520	C-4	TP543	B-4		
				TP521	C-4	TP544	A-4		



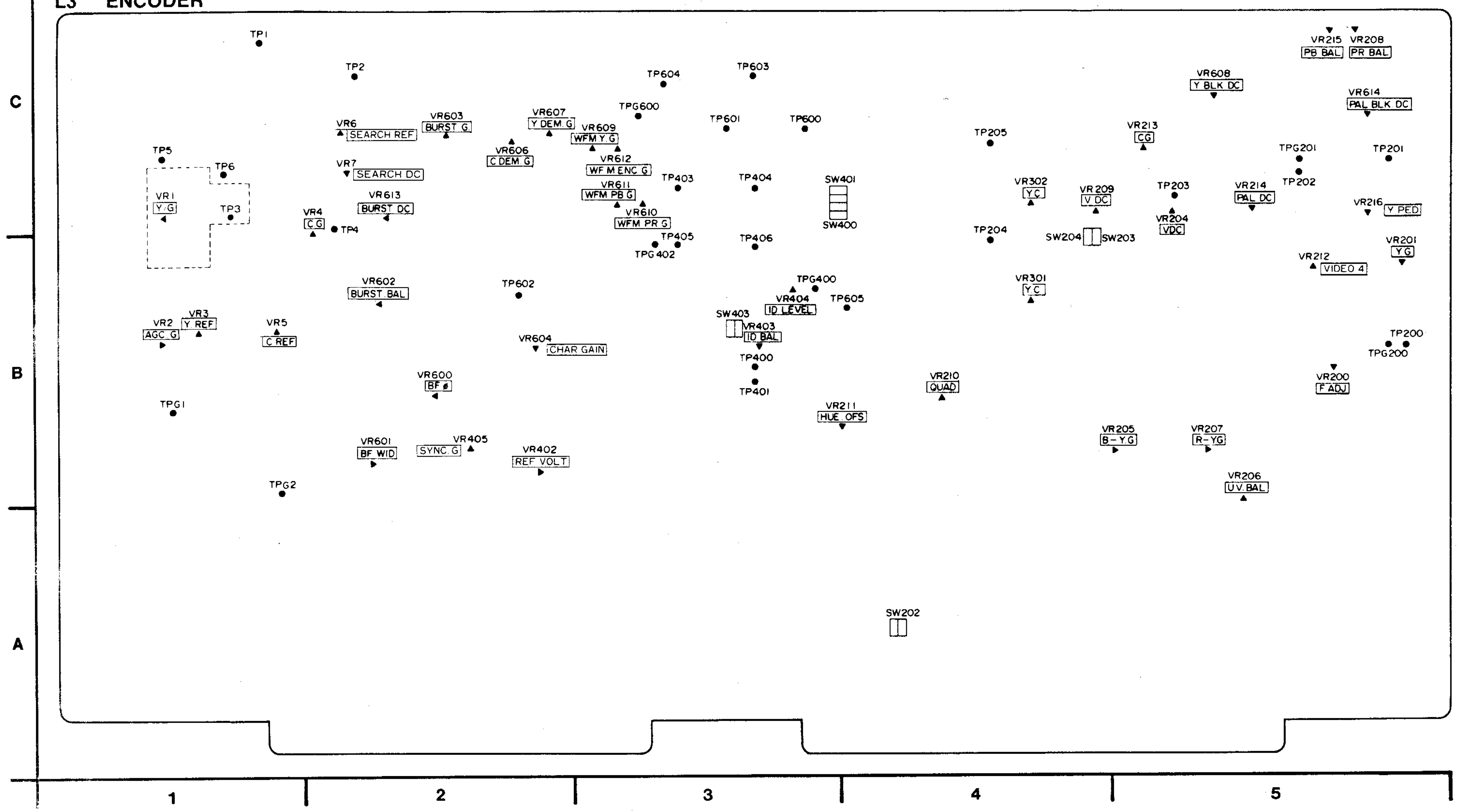
L2 TBC 2

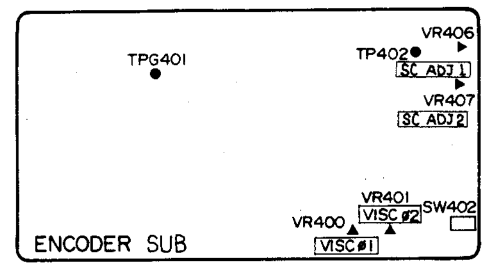


TP	ADDRESS	VR	ADDRESS	VR	ADDRESS
TP5 5	B-3	VR501	B-5	VR522	C-3
		VR502	B-5	VR523	B-5
		VR503	B-5	VR524	B-4
TP	ADDRESS	VR504	B-5	VR525	B-5
		VR505	B-5	VR558	B-5
TPG1	C-3	VR506	C-5	VR1001	C-3
TPG2	A-3	VR507	C-5		
T 3	C-2	VR508	B-5		
T 4	A-1	VR509	B-5		
TPG501	A-5	VR510	C-5		
TP502	C-5	VR512	C-5		
T 503	B-4	VR514	C-5		
TPG504	B-3	VR515	B-4		
		VR516	C-4		
		VR518	C-5		
		VR521	C-4		

L	ADDRESS	SW	ADDRESS	TP	ADDRESS	TP	ADDRESS	TPG	ADDRESS	VR	ADDRESS	VR	ADDRESS
L11	B-2	SW1	B-2	TP1	A-5	TP20	C-2	TPG1	C-1	VR2	A-5		
				TP2	A-4	TP21	C-3	TPG2	A-1	VR3	C-5		
				TP3	A-5	TP22	C-2	TPG3	C-3	VR6	B-1		
				TP4	B-5	TP23	C-3	TPG4	A-3	VR8	C-7		
				TP5	C-4	TP24	C-2	TPG5	C-5	VR9	C-2		
				TP6	C-3	TP25	C-2	TPG6	A-5	VR10	C-2		
				TP7	C-5	TP30	B-3			VR11	C-1		
				TP9	B-4	TP31	B-3			VR12	A-3		
				TP10	C-3	TP32	C-2						
				TP11	B-2	TP33	C-2						
				TP12	B-3	TP34	B-1						
				TP13	C-1								
				TP16	C-3								
				TP17	C-2								
				TP18	C-3								
				TP19	C-2								

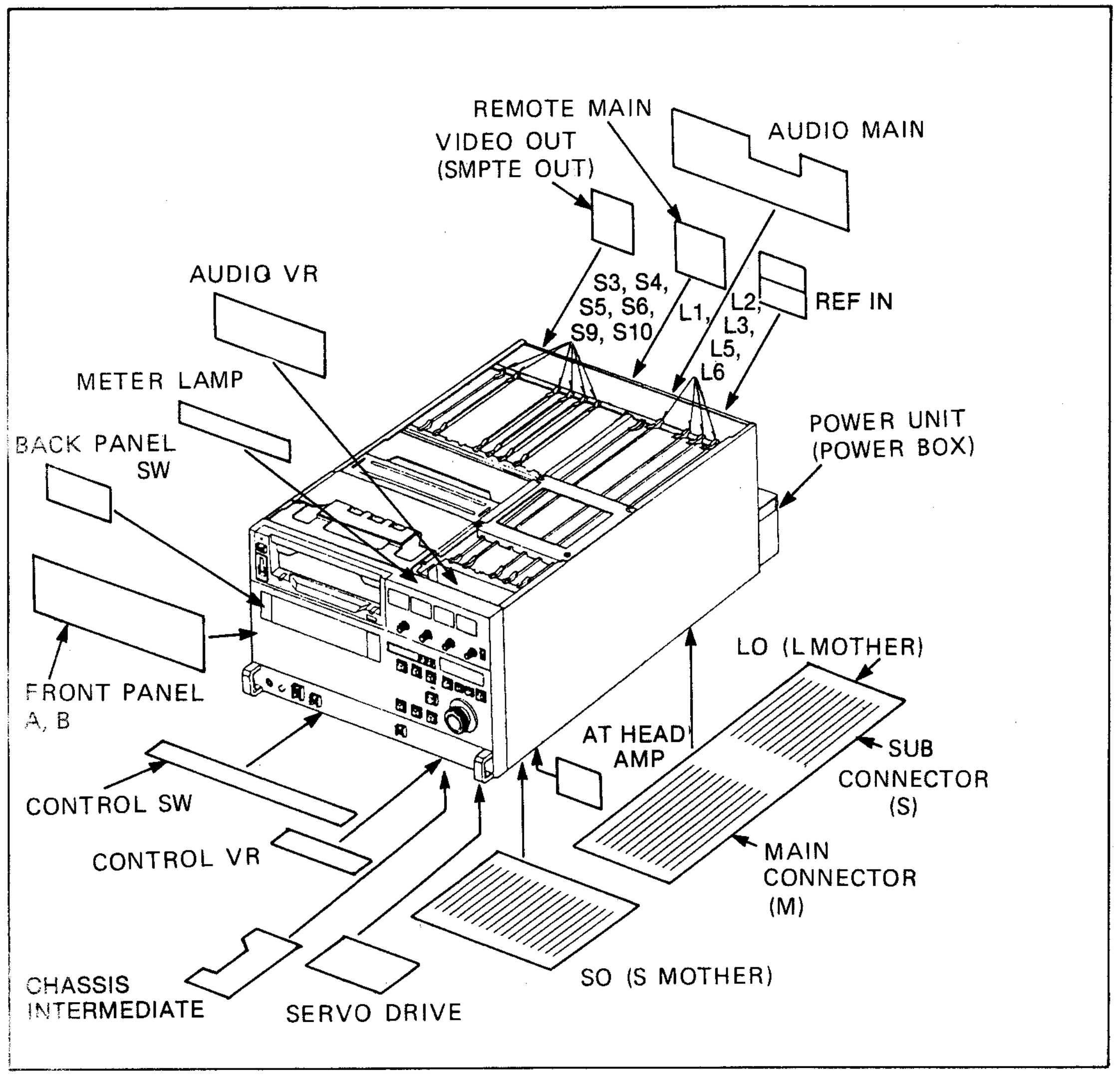
L3 ENCODER



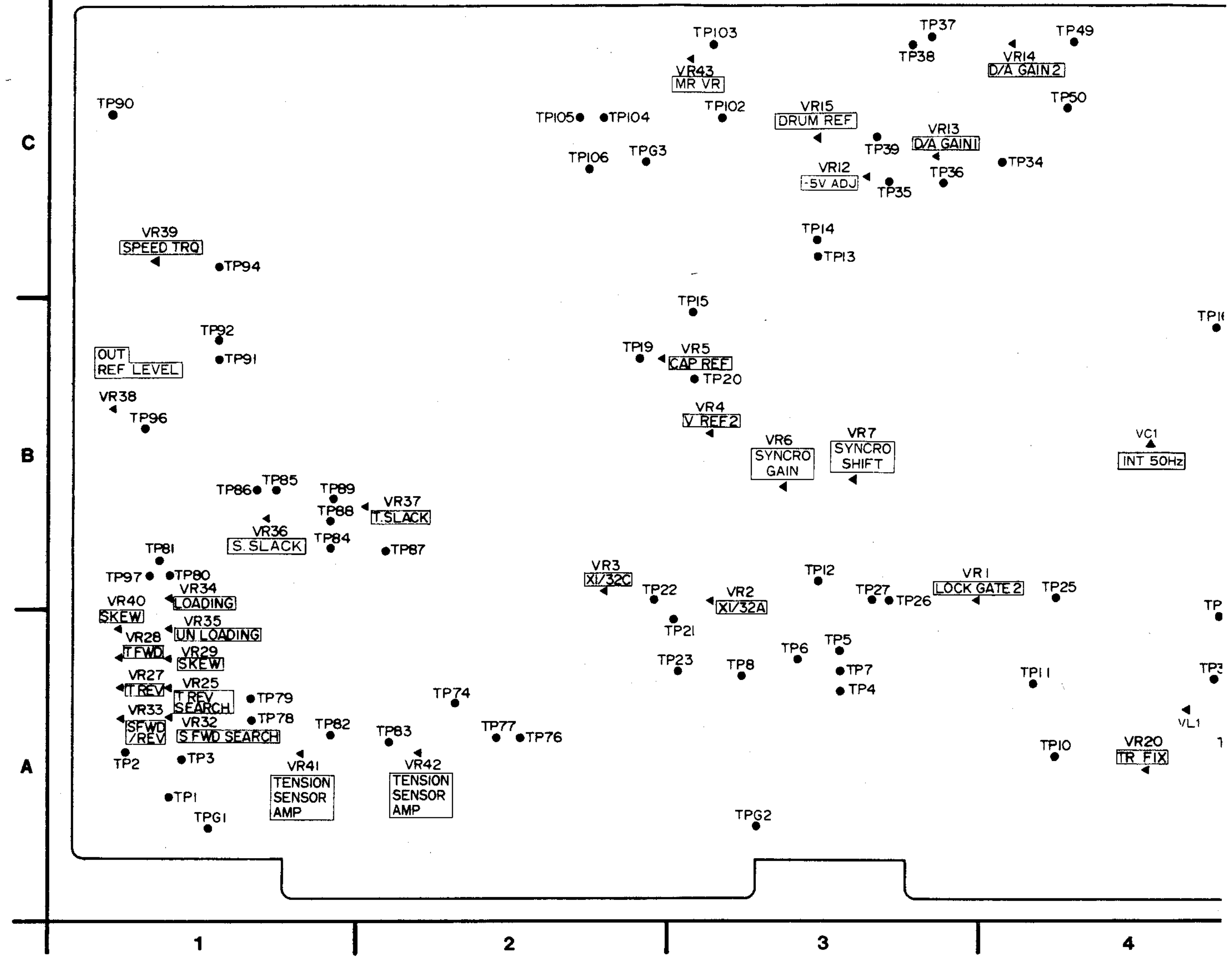


SW	ADDRESS	TP	ADDRESS	TP	ADDRESS	TPG	ADDRESS	VR	ADDRESS	VR	ADDRESS	VR	ADDRSS
SW202	A-4	TP1	C-1	TP405	B-3	TPG1	B-1	VR1	C-1	VR211	B-3	VR604	B-2
SW203	B-4	TP2	C-2	TP406	B-3	TPG2	B-1	VR2	B-1	VR212	B-5	VR606	C-2
SW204	B-4	TP3	C-1	TP600	C-3	TPG200	B-5	VR3	B-1	VR213	C-5	VR607	C-2
SW400	C-3	TP4	B-2	TP601	C-3	TPG201	C-1	VR4	B-1	VR214	C-5	VR608	C-5
SW401	C-3	TP5	C-1	TP602	B-2	TPG400	B-3	VR5	B-1	VR215	C-5	VR609	C-3
SW403	B-3	TP6	C-1	TP603	C-3	TPG402	B-3	VR6	C-2	VR216	C-5	VR610	C-3
		TP200	B-5	TP604	C-3	TPG600	C-3	VR7	C-2	VR301	B-4	VR611	C-3
		TP201	C-5	TP605	B-3			VR200	B-5	VR302	C-4	VR612	C-3
		TP202	C-5					VR201	B-5	VR402	B-2	VR613	C-5
		TP203	C-5					VR204	C-5	VR403	B-3	VR614	C-5
		TP204	B-4					VR205	B-4	VR404	B-3		
		TP205	C-4					VR206	B-5	VR405	B-2		
		TP400	B-3					VR207	B-5	VR600	B-2		
		TP401	B-3					VR208	C-5	VR601	B-2		
		TP403	C-3					VR209	C-4	VR602	B-2		
		TP404	C-3					VR210	B-4	VR603	C-2		

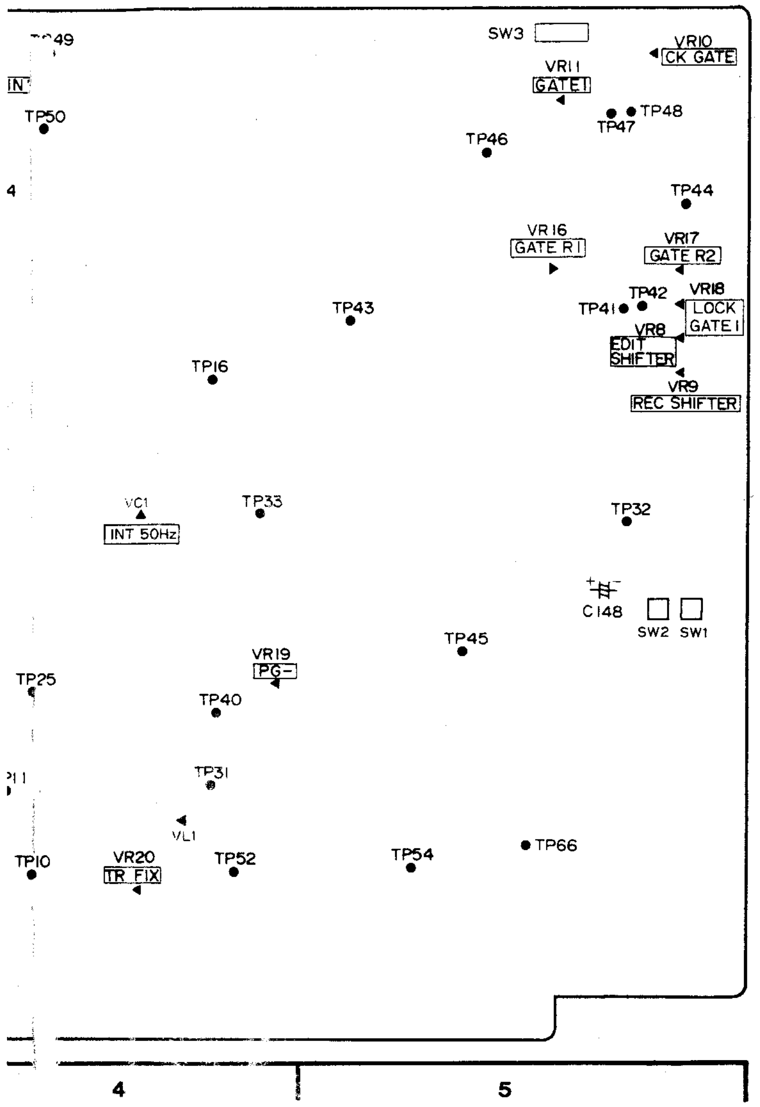
P.C. Board Location



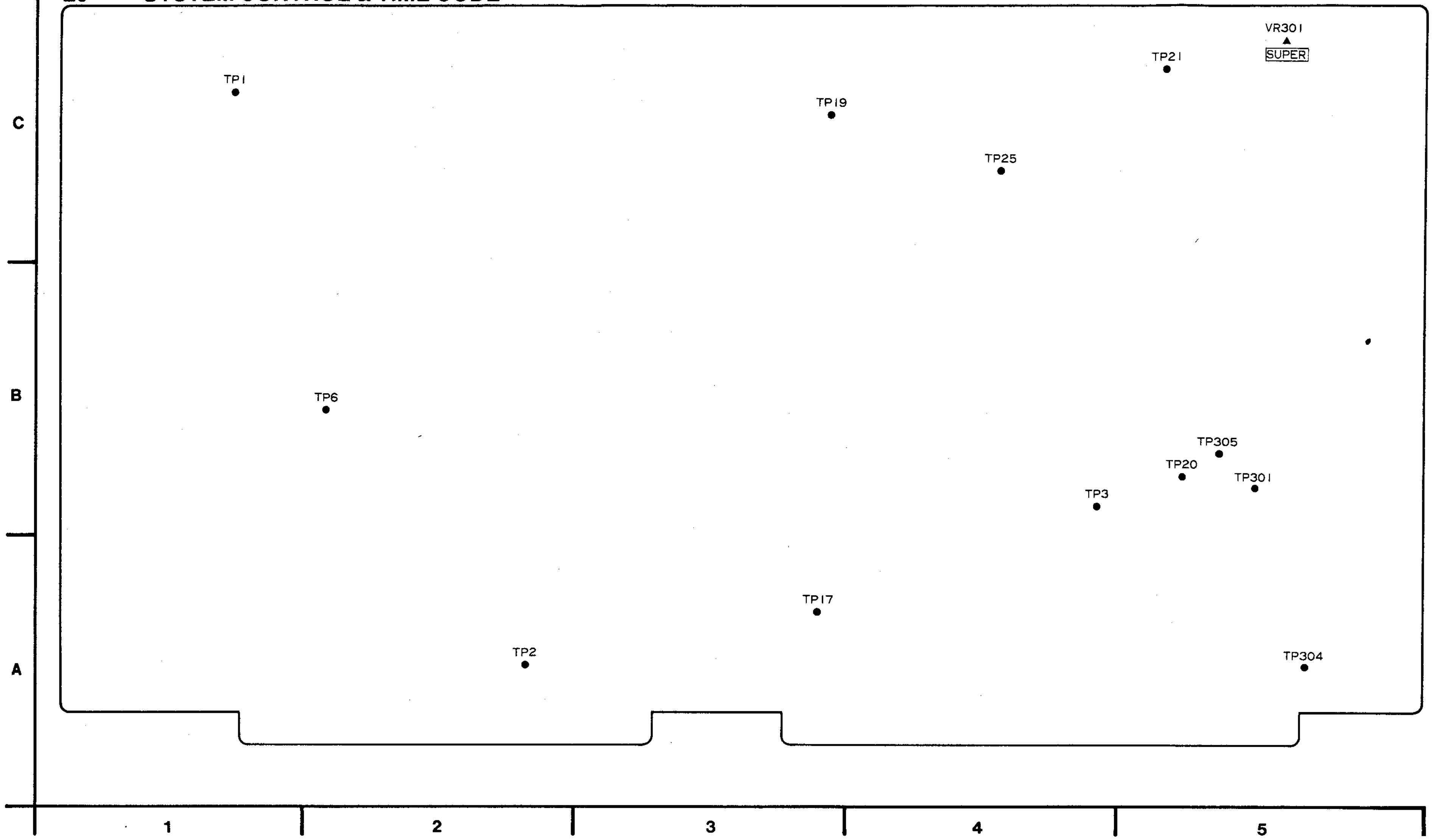
L5 SERVO & TIMING



C	ADDRESS	TP	ADDRESS	TP	ADDRESS	TP	ADDRESS	TP	ADDRESS
C148	B-5	TP1	A-1	TP20	B-3	TP40	A-4	TP77	A-2
		TP2	A-1	TP21	A-2	TP41	C-5	TP78	A-1
		TP3	A-1	TP22	B-2	TP42	C-5	TP79	A-1
SW	ADDRESS	TP4	A-3	TP23	A-3	TP43	C-5	TP81	B-1
		TP5	A-3	TP25	B-4	TP44	C-5	TP82	A-1
SW1	B-5	TP6	A-3	TP26	B-3	TP45	B-5	TP83	A-2
SW2	B-5	TP7	A-3	TP27	B-3	TP46	C-5	TP84	B-1
SW3	C-5	TP8	A-3	TP31	A-4	TP47	C-5	TP85	B-1
		TP10	A-4	TP32	B-5	TP48	C-5	TP86	B-1
		TP11	A-4	TP33	B-4	TP49	C-4	TP87	B-2
		TP12	B-3	TP34	C-4	TP50	C-4	TP88	B-1
		TP13	C-3	TP35	C-3	TP52	A-4	TP89	B-1
		TP14	C-3	TP36	C-3	TP54	A-5	TP80	B-1
		TP15	B-3	TP37	C-3	TP66	A-5	TP90	C-1
		TP16	B-4	TP38	C-3	TP74	A-2	TP91	B-1
		TP19	B-2	TP39	C-3	TP76	A-2	TP92	B-1

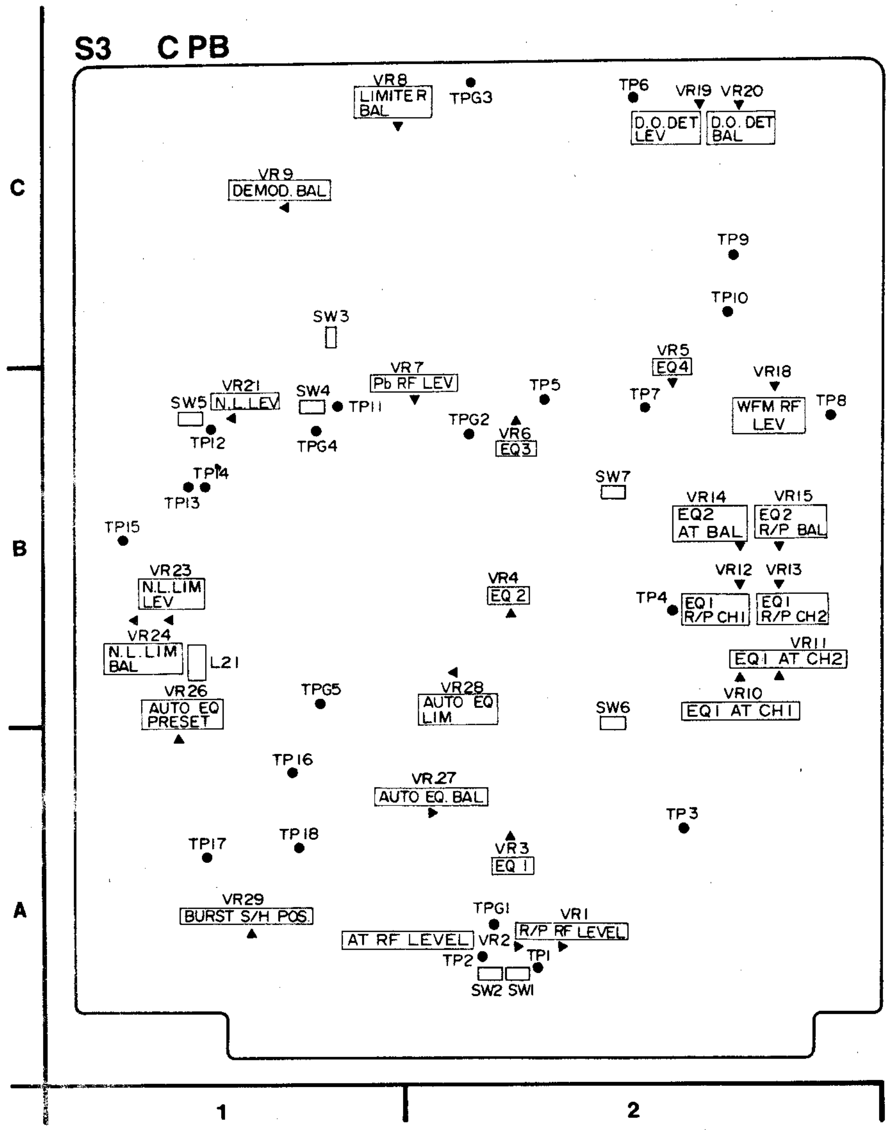


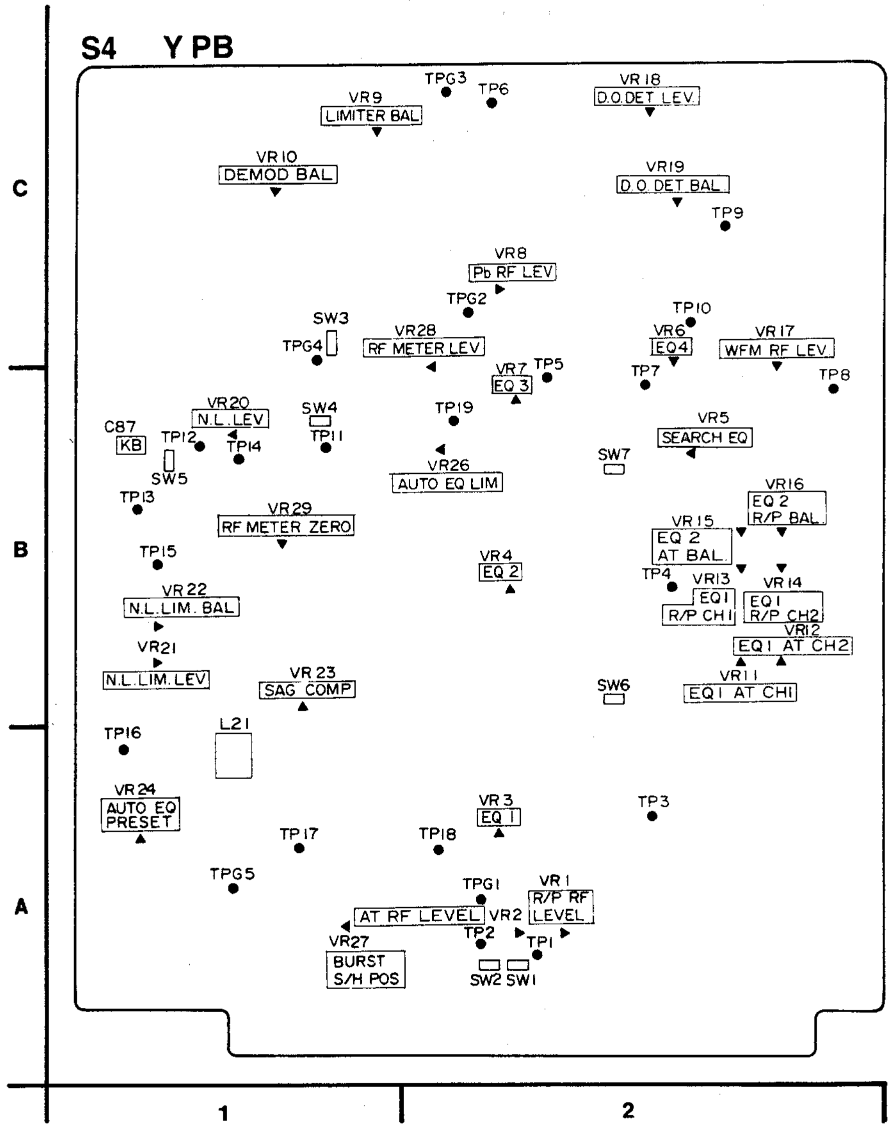
L6 SYSTEM CONTROL & TIME CODE

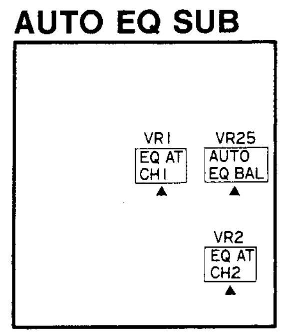


P	ADDRESS	TP	ADDRESS	VC	ADDRESS	VR	ADDRESS	VR	ADDRESS	VR	ADDRESS
77	A-2	TP94	C-1	VC1	B-4	VR1	B-3	VR17	C-5	VR40	A-1
78	A-1	TP96	B-1			VR2	B-3	VR18	C-5	VR41	A-1
79	A-1	TP97	B-1			VR3	B-2	VR19	B-4	VR42	A-2
81	B-1	TP102	C-3	VL	ADDRESS	VR4	B-3	VR20	A-4	VR43	C-3
82	A-1	TP103	C-3			VR5	B-2	VR25	A-1		
83	A-2	TP104	C-2	VL1	A-4	VR6	B-3	VR27	A-1		
84	B-1	TP105	C-2			VR7	B-3	VR28	A-1		
85	B-1	TP106	C-2			VR8	B-5	VR29	A-1		
86	B-1					VR9	B-5	VR32	A-1		
87	B-2					VR10	C-5	VR33	A-1		
88	B-1	TPG	ADDRESS			VR11	C-5	VR34	B-1		
89	B-1					VR12	C-3	VR35	A-1		
80	B-1	TPG1	A-1			VR13	C-3	VR36	B-1		
90	C-1	TPG2	A-3			VR14	C-4	VR37	B-2		
91	B-1	TPG3	C-2			VR15	C-3	VR38	B-1		
92	B-1					VR16	C-5	VR39	C-1		

TP	ADDRESS	VR	ADDRESS
TP1	C-1	VR301	C-5
TP2	A-1		
TP3	A-4		
TP6	B-2		
TP17	A-3		
TP19	C-3		
TP20	B-5		
TP21	C-5		
TP25	C-4		
TP301	B-5		
TP304	A-5		
TP305	B-5		





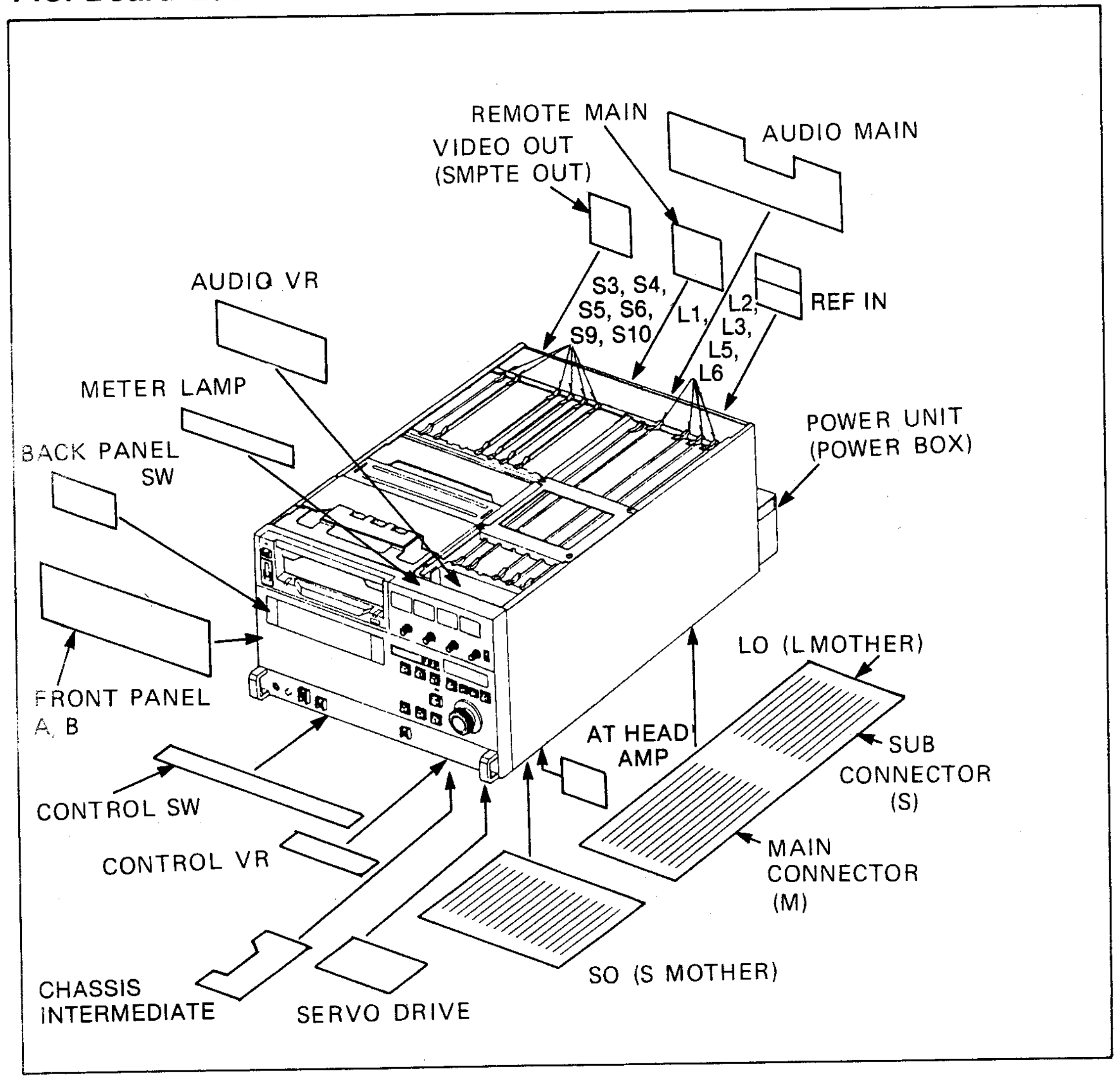


L	ADDRESS	TP	ADDRESS	TP	ADDRESS	TPG	ADDRESS	SW	ADDRESS	VR	ADDRESS	VR	ADDRESS
L21	B-1	TP1	A-2	TP17	A-1	TPG1	A-2	SW1	A-2	VR1	A-2	VR19	C-2
		TP2	A-2	TP18	A-1	TPG2	B-5	SW2	A-2	VR2	A-2	VR20	C-2
		TP3	A-2			TPG3	C-2	SW3	C-1	VR3	A-2	VR21	B-1
		TP4	B-2			TPG4	B-1	SW4	B-1	VR4	B-2	VR23	B-1
		TP5	B-2			TPG5	B-1	SW5	B-1	VR5	B-2	VR24	B-1
		TP6	C-2					SW6	B-2	VR6	B-2	VR26	B-1
		TP7	B-2					SW7	B-2	VR7	B-1	VR27	A-2
		TP8	B-2							VR8	C-1	VR28	B-2
		TP9	C-2							VR9	C-1	VR29	A-1
		TP10	C-2							VR10	B-2		
		TP11	B-1							VR11	B-2		
		TP12	B-1							VR12	B-2		
		TP13	B-1							VR13	B-2		
		TP14	B-1							VR14	B-2		
		TP15	B-1							VR15	B-2		
		TP16	A-1							VR18	B-2		

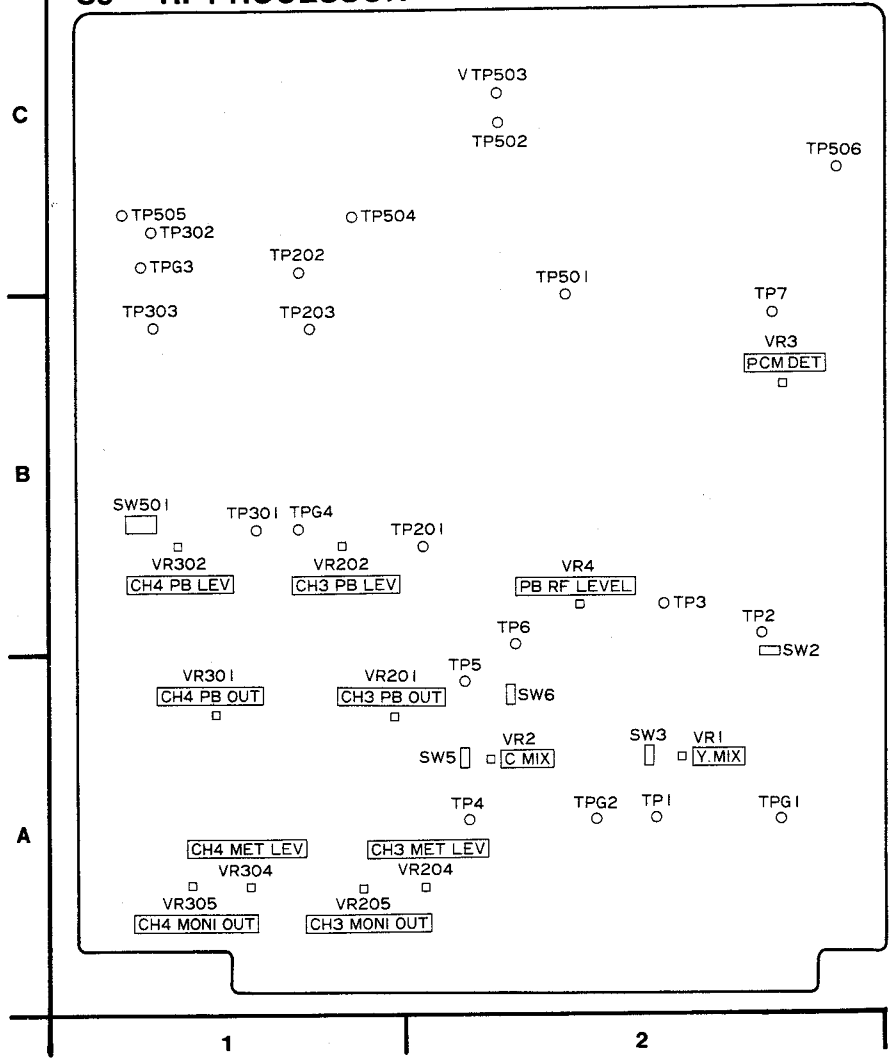
C	ADDRESS	SW	ADDRESS	TP	ADDRESS	TP
C87	B-1	SW1	A-2	TP1	A-2	TP17
		SW2	A-2	TP2	A-1	TP18
		SW3	C-1	TP3	A-2	TP19
L	**ADDRESS**	SW4	B-1	TP4	B-2	
		SW5	B-1	TP5	B-2	
L21	A-1	SW6	B-2	TP6	C-2	
		SW7	B-2	TP7	B-2	
				TP8	B-2	
				TP9	C-2	
				TP10	C-2	
				TP11	B-1	
				TP12	B-1	
				TP13	B-1	
				TP14	B-1	
				TP15	B-1	
				TP16	A-1	

ADDRESS	TP	ADDRESS	TPG	ADDRESS	VR	ADDRESS	VR	ADDRESS
A-2	TP17	A-1	TPG1	A-1	VR1	A-2	VR17	B-2
A-1	TP18	A-1	TPG2	C-1	VR2	A-2	VR18	C-2
A-2	TP19	B-1	TPG3	C-1	VR3	A-2	VR19	C-2
B-2			TPG4	B-1	VR4	B-2	VR20	B-1
B-2			TPG5	A-1	VR5	B-2	VR21	B-1
C-2					VR6	B-2	VR22	B-1
B-2					VR7	B-2	VR23	B-1
B-2					VR8	C-2	VR24	A-1
C-2					VR9	C-1	VR26	B-1
C-2					VR10	C-1	VR27	A-1
B-1					VR11	B-2	VR28	B-1
B-1					VR12	B-2	VR29	B-1
B-1					VR13	B-2		
B-1					VR14	B-2		
B-1					VR15	B-2		
A-1					VR16	B-2		

P.C. Board Location

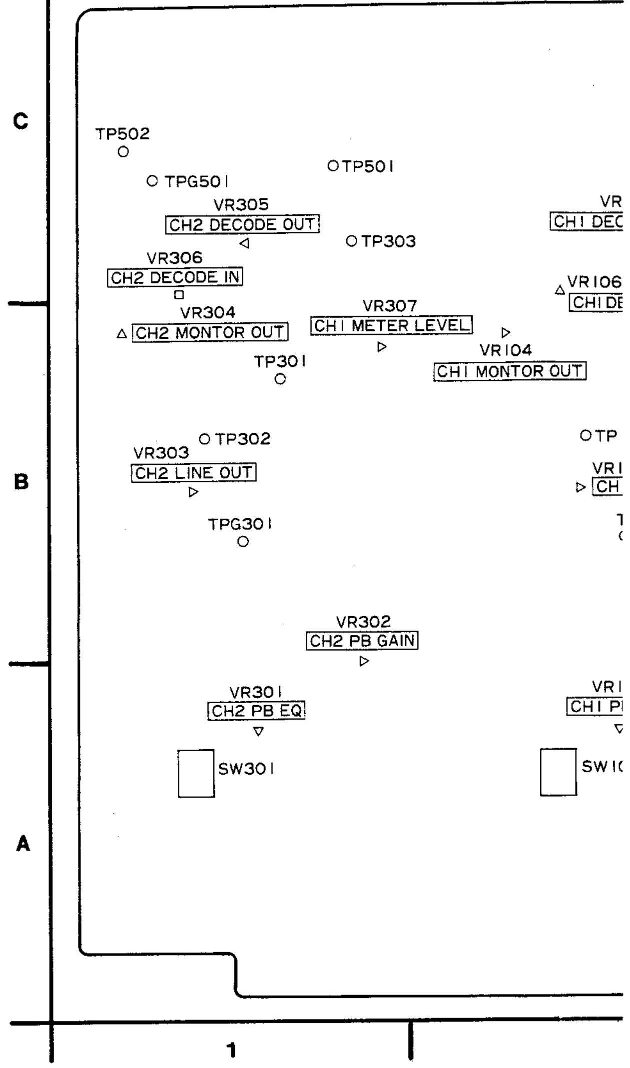


S5 RF PROCESSOR

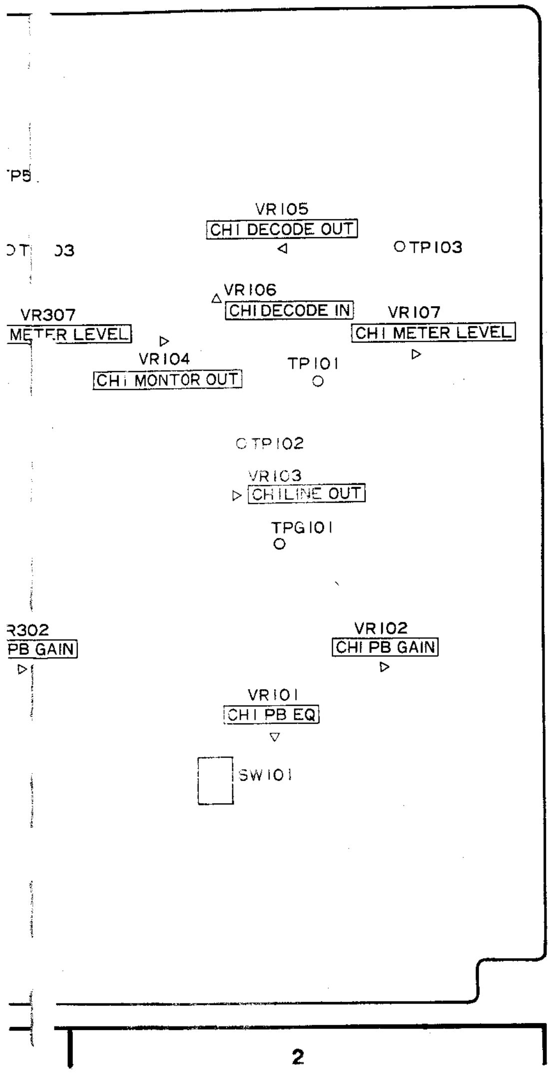


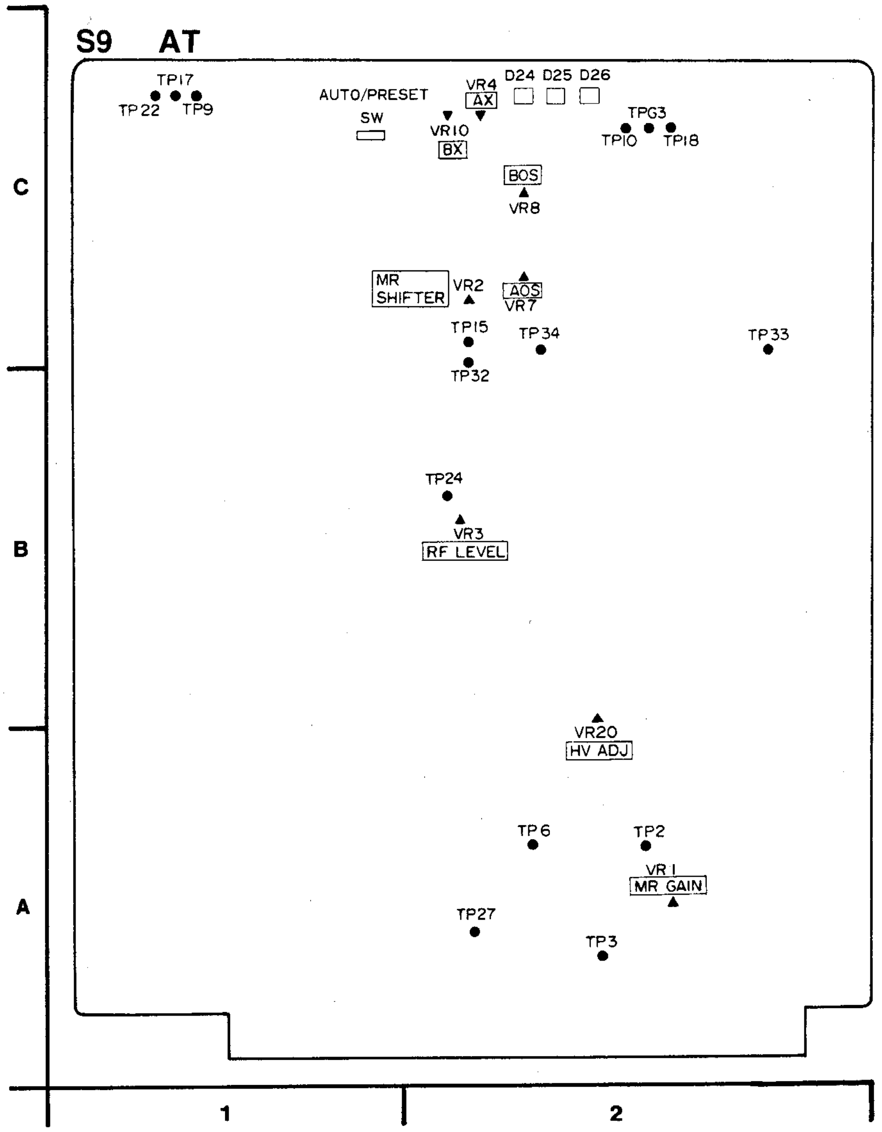
SW	ADDRESS	TP	ADDRESS	TP	ADDRESS	TPG	ADDRESS	VR	ADDRESS
SW2	B-2	TP1	A-2	TP504	C-1	TPG1	A-2	VR1	A-2
SW3	A-2	TP2	B-2	TP505	C-1	TPG2	A-2	VR2	A-2
SW5	A-2	TP3	B-2	TP506	C-2	TPG3	C-1	VR3	B-2
SW6	A-2	TP4	A-2			TPG4	B-1	VR4	B-2
SW501	B-1	TP5	A-2					VR201	A-1
		TP6	B-2					VR202	B-1
		TP7	B-2					VR204	A-2
		TP201	B-2					VR205	A-1
		TP202	C-1					VR301	A-1
		TP203	B-1					VR302	B-1
		TP301	B-1					VR304	A-1
		TP302	C-1					VR305	A-1
		TP303	B-1						
		TP501	C-2						
		TP502	C-2						
		TP503	C-2						

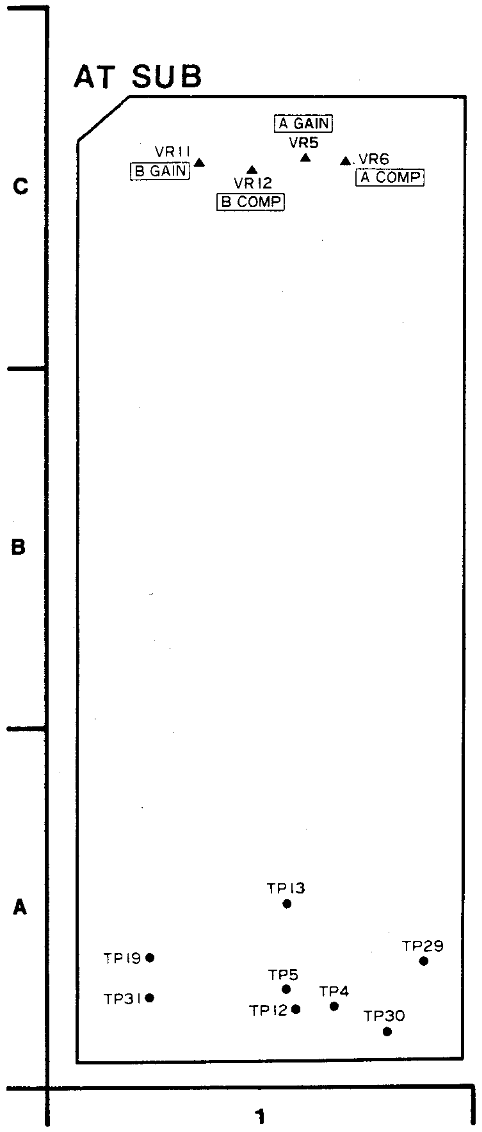
S6 AUDIO 1



SW	ADDRESS	TP	ADDRESS	TPG	A
SW101	A-2	TP101	B-2	TPG101	
SW301	A-1	TP102	B-2	TPG301	
		TP103	C-2	TPG501	
		TP301	B-1		
		TP302	B-1		
		TP303	C-1		
		TP501	C-1		
		TP502	C-1		





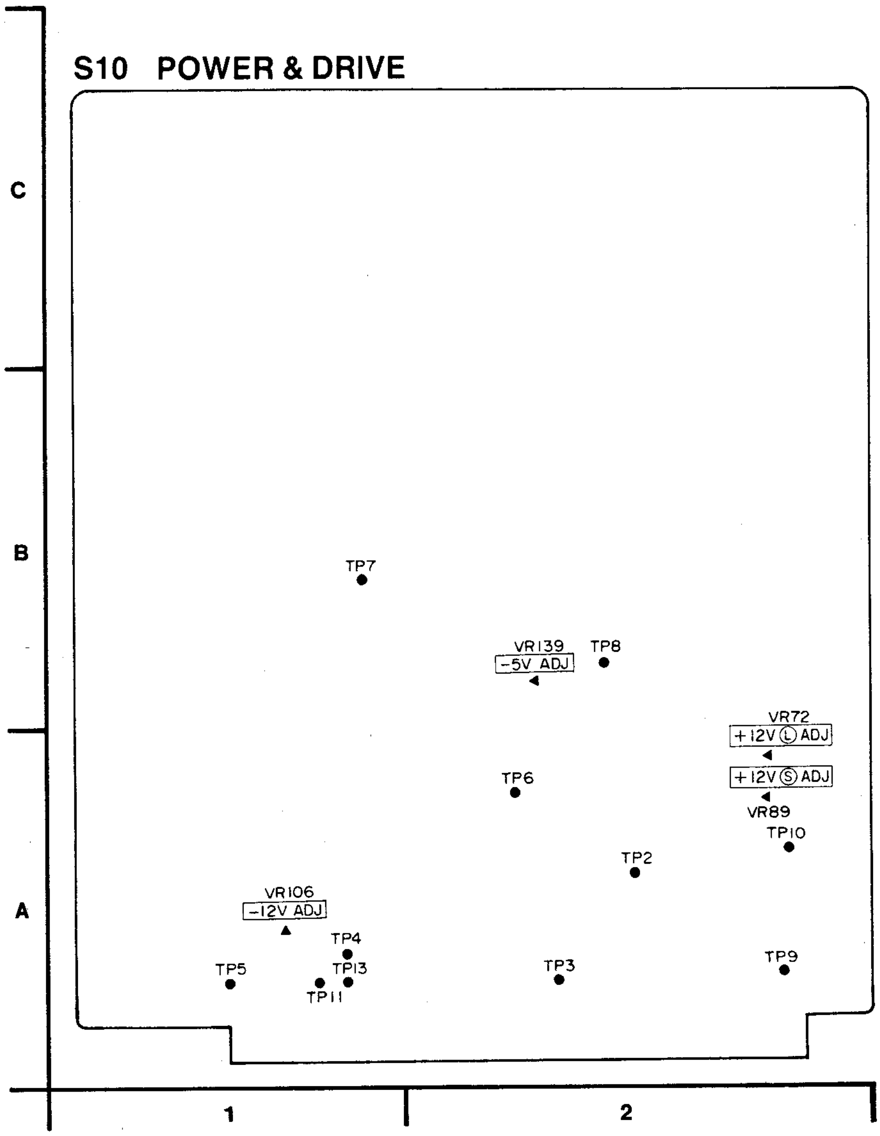


ADDRESS	TPG	ADDRESS	VR	ADDRESS
2	TPG101	B-2	VR101	A-2
2	TPG301	B-1	VR102	B-2
C-2	TPG501	C-1	VR103	B-2
B-1			VR104	B-2
1			VR105	C-2
1			VR106	C-2
C-1			VR107	B-2
1			VR301	A-1
			VR302	B-1
			VR303	B-1
			VR304	C-1
			VR305	C-1
			VR306	C-1
			VR307	B-1

TP	ADDRESS	TPG	ADDRESS	VR	ADDRESS
TP2	A-2	TPG3	C-2	VR1	A-2
TP3	A-2			VR2	C-2
TP6	A-2			VR3	B-2
TP9	C-1			VR4	C-2
TP10	C-2			VR7	C-2
TP15	C-2			VR8	C-2
TP17	C-1			VR10	C-2
TP18	C-1			VR20	B-2
TP22	C-1				
TP24	B-2				
TP27	A-2				
TP32	C-2				
TP33	C-2				
TP34	C-2				

TP	ADDRESS	VR	ADDRESS
TP4	A-2	VR5	C-2
TP5	A-2	VR6	C-2
TP12	A-2	VR11	C-1
TP13	A-2	VR12	C-1
TP19	A-1		
TP20	A-2		
TP30	A-2		
TP31	A-1		

S10 POWER & DRIVE



TP	ADDRESS	VR	ADDRESS
TP2	A-2	VR72	A-2
TP3	A-2	VR89	A-2
TP4	A-1	VR106	A-1
TP5	A-1	VR139	B-2
TP6	A-2		
TP7	B-1		
TP8	B-2		
TP9	A-2		
TP10	A-2		
TP11	A-1		
TP13	A-1		

Module

- ***IC Information***
- ***Block Diagram***
- ***Printed Circuit Board***
- ***Schematic Diagram***

Note :

1. Do not use the part number shown on the schematic diagram or P.C. Board layout for ordering.
   The correct part number for ordering is shown in the Exploded View/ Parts List section.
2. Unless otherwise specified, all resistors are in OHMS, K = 1,000 OHMS, all capacitors are in MICROFARADS (μF), P = $\mu\mu$F.
3. The foil patern on the P.C.Board layout printed with the blue color is component side.

(D)

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ABBREVIATIONS

12LP	:12 Line Pulse(PAL)
15LP	:15 Line Pulse(NTSC)
4F	:4 Frame (Color)
4fsc	:x4 Sub Carrier Frequency (NTSC–14.32MHz, PAL–17.72MHz)

–A–

A/D	:Analog/Digital
A/E	:Audio Erase
ADBF	:Advance Burst Flag
ADD	:Adder
ADDR.	:Address
ADS	:Advance Set
ADV	:Advance
AFC	:Automatic Frequency Control
AGC	:Automatic Gain Control
ALE	:Address Latch Enable
AMP	:Amplifier
APC	:Automatic Phase Control
APT	:Aperture
AT	:Automatic Tracking
AT AK	:Automatic Tracking Acknowledge
ATT	:Attenuator
AVE	:Average

–B–

B.P.F.	:Band Pass Filter
BAL	:Balance
BDET	:Burst Detect
BEG	:Begin
BF	:Burst Flag
BLK	:Blanking
BS	:Burst Sync
BS SC	:Burst Sync Sub Carrier
BU	:Burst
B/W	:Black/White

–C–

C	:Chrominance Color
CASSET	:Casseete
CBK	:Chroma Blanking
C.H.SW	:Chroma Head Switching
C.SY POS	:Chroma Sync Position
CAL	:Calibration
CAP	:Capstan
CARR	:Carrier
CBF	:Color Burst Flag
CBK	:Composite Blanking Signal
CBU	:Color Burst
CCA	:Current Controlled Amplifier
CF	:Color Framing
CFN	:Color FramiNg
CFP	:Color Framing Pulse
CK	:Clock
CKSW	:Clock signal Switching
CLP	:Clamp
CLR	:Clear
CMND	:Command
CNBK	:Chroma digital Blanking Signal
CNC	:Chroma Noise Correction
COM	:Comb filter
COMP	:Compensator
CONT	:Control
CONV	:Converter
CP	:Clamp Pulse
CPNT	:Component
CPU	:Central Processing Unit
CS	:Composite Synchronization signal Chip Select
CTCM	:Chroma Time Compressed Multiplex
CTL/E	:Control/Erase
CTL/H	:Control/Head
CURR	:Current
CWCK	:Color Write ClocK
CYL	:Cylinder

–D–

D. STILL	:Dial Still
D/A	:Digital/Analog
D/D	:DC to DC
DEC	:Decode
DEMG	:Demodu Gain
DET	:Detector
DEMOD	:Demodulator
DEV	:Deviation
DIV	:Divider
DL	:Delay
DO	:Drop Out
DOC	:Drop Out Compensator
DOD	:Drop Out Detect
DOP	:Drop Out Pulse
DRDHD	:Delayed Read Horizontal Drive
DUB	:Dubbing

–E–

EE	:Electronics to Electronics
EF	:Emitter Folower
EN	:Enable
ENC	:Encoder
ENV	:Envelope
EQ	:Equalizer
EQP	:Equalizing Pulse
EXT	:External

–F–

F.F.	:Flip Flop
F/E	:Full Erase
FG	:Frequency Generator
FIFO	:First In First Out
FIP	:Fluorescent Information Panel
FM	:Frequency Modulation
FMT	:Format
FR	:Framing
FREQ	:Frequency
FRM	:Framing

–G–

GEN	:Generator
GND	:Ground

–H–

H. SYNC	:Horizontal Synchronization signal
H.P	:Headphone
HD	:Horizontal Drive
HO	:H Out
HR	:Horizontal Synchronization signal Reset
HSEL	:Horizontal Synchronization signal Select
HSW	:Head Switching pulse
HV	:High Voltage

–I–

I/F	:Interface
IFR	:Incoming Video Framing
INCOM SCH	:Incaming SCH
INH	:Inhibite
INT	:Integrator Internal
IORQ	:Input/Output Request signal
IRQ	:Interupt Request signal
ISY	:composite Synchronization signal
IVS	:Incoming Vertical Synchronization signal

–K–

K SCAN	:Key Scan

–L–

L. CASSETTE	:Large Cassette
L.P.F	:Low Pass Filter
LAL	:Line Alternater
LIM	:Limiter
LSEL	:Vertical Syncronization signal Select
LTC	:Longitudinal Time Code
LTC–UB	:Longitudinal – Use's Bit

–M–

M–COM	:Motor Common
M.M.V	:Monostable Multivibrator
MECHA	:Mechanism
MEMR	:Memory Read
MEMW	:Memory Write
MOD	:Mode Modulator
MOIH	:Middle of H Pulse
MONI	:Monitor
MPU	:Microprocessor Unit
MPX	:Multiplexer
MR	:Magnetic Resistor
MUT	:Muting

–N–

NL	:Non Linear
NR	:Noise Reduction
NSTD	:Non Standand

–O–

OC	:Output Control
OFS	:Offset
OS	:OffSet
OSC	:Oscillator

–P–

P–>S	:Parallel to Serial
P.S	:Phase Shift
PAL	:Phase Alternation by Line
PALP	:PAL Pulse
PC	:Phase Compensator
PCM	:Pulse Code Modulation
PFBW	:PAL Framing Blanking With
PG	:Pulse Generator
PINH	:VISC Phase Control Inhibit
POS	:Position
POS CHANG	:Position Change
PROM	:Programmable Read Only Memory
PST	:Phase Step
PWM	:Pulse Width Modulation

–R–

R ADRS	:Read Address
R FRAMING	:Read Framing
R FRM	:Read Framing
R HS	:Reference Horizontal Synchronization signal
R.E	:Rotary Erase
RA	:Record Amplifier
RAM	:Random Access Memory
RCK	:Read Clock
RDHD	:Read Horizontal Drive
RE	:Read Enable
REC	:Record
REF	:Reference
REG	:Regulator
REGEN	:Regenerator
REM	:Remote
REMOCON	:Remote Control
RET	:Return
REV	:Reverse
RFRM	:Reference Framing signal
RHD	:Reference Horizontal Drive signal
RHS	:Reference Horizontal Synchronization signal
ROM	:Read Only Memory
RPH	:Record/Playback Head select
RST	:Reset
RSY	:Reference Video Composite Synchronization signal
RXD	:Receive Data
RYS	:Pr Sync

–S–

S DET	:Synchronization signal Detector
S. RL FG	:Supply ReeL Frequency Generator
S. ROLL	:Supply Roll
S. TH	:Supply Reel Thermister
S.BRAKE	:Supply Brake
S/H	:Sample and Hold
SC	:Sub Carrier
SCC	:Sub Carrier Phase Control
SCH	:Sub Carrier to Horizontal Sync
SCLK	:Serial ClocK
SDET	:Sync Detection
SEP	:Separator
SHP	:Sample and Hold Pulse
SIG	:Signal
SIO	:Serial Input/Output
SOL	:Solenoid
SSEL	:Source Search Slect
SSER	:Source Search Selector
STB	:Strobe
STBCK	:Strobe Clock
STD	:Standard
SYS H	:System H Phase
SYS HS	:System H Phase
SYS SC	:System Sub Carrier
SYS SCS	:System Sub Carrier phase
SYSCON	:System Control

–T–

T. RL FG	:Takeup ReeL Frequency Generator
T. ROLL	:Takeup Roll
T. TH	:Takeup Thermistor
T.BRAKE	:Takeup Brake
TBC	:Time Base Corrector
TC	:Time Code
TC/E	:Time Code/Erase
TCM	:Time Code Modulation
TERM	:Termination
TMCLK	:Timer Clock
TMOT	:Time Out
TR	:Tracking Transistor
TRP	:Trapezoide signal
TRQ	:Torque
TST	:Test
TXD	:Transmitted Data

–U–

U/D	:Up/Down
UNREG	:Unregulate

–V–

V	:Vertical
V. SYNC	:Vertical Synchronization signal
VCO	:Voltage Control Oscillator
VD	:Vertical Drive
VI	:Vertical Interval
VIGE	:Vertical Interval Gate
VIP	:Vertical Interval Pulse
VITC	:Vertical Interval Time Code
VP	:Vertical Pulse
VPH	:Video signal Phase
VR	:Volume Resistor
VISC	:Vertical Interval Sub Carrier
VSP	:Vertical Separation Pulse
VS	:Vertical Phase

–W–

W ADRS	:Write Address
W.R. RST	Write/Read Reset
WCK	:Write Clock
WFM	:Wave Form Monitor
WHD	:Write Horizontal Drive signal
WR	:Write

–X–

XTAL	:Cristal

–Y–

Y	:luminance
YBF	:luminance Burst Flag
YBU	:luminance Burst
YC	:Luminance Chrominance
YNBK	:luminance digital Blanking signal
YW	:luminance Write

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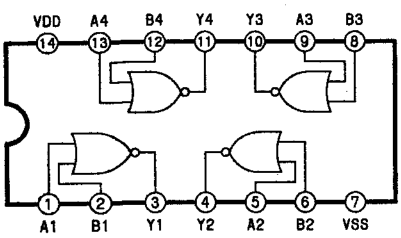
TL072	TL072	33
TL072CP	TL072	33
TL082CP	TL082	33
TL084CNS	TL084	34
TL431CLPB	TL431	34
TL592BP	TL592	34
TL592P	TL592	34
TL601	TL601	35
TL607CP	TL607	35
TL7705CP	TL7705	35
TL7705CPB	TL7705	35
TL810C	TL810	35
TL810CP	TL810	35
TL810CPS	TL810	35
TL820C	TL820	35
TMP82C55AF2	TMP82C55AF2	35
TMP82C55AP2	TMP82C55AP2	50
TMP82C79F2	TMP82C79F2	36
TMP82C79P2	TMP82C79P2	51
TMPZ84C00AP	TMPZ84C00AP6	36
TMPZ84C00AP6	TMPZ84C00AP6	36
TMPZ84C30AF6	TMPZ84C30AF6	36
TMPZ84C30AP	TMPZ84C30AP6	53
TMPZ84C40AP	TMPZ84C40AP6	37
TMPZ84C40AP6	TMPZ84C40AP6	37
TMPZ84C43AF6	TMPZ84C43AF6	37
UPC311C	UPC311	37
UPC311G	UPC311	37
UPC319C	UPC319	37
UPC319G	UPC319	37
UPC324C	UPC324	37
UPC324G	UPC324	37
UPC339C	UPC339	37
UPC358C	UPC358	37
UPC358G	UPC358	38
UPC393C	UPC393	38
UPC393G	UPC393	38
UPC398C	UPC398C	38
UPC4082C	UPC4082	38
UPC4082G	UPC4082	38
UPC4084C	UPC4084	38
UPC451C	UPC451	38
UPC451G	UPC451	38
UPC4557C	UPC4557	38
UPC4558C	UPC4558	38
UPC4558G	UPC4558	38
UPC4560C	UPC4560	38
UPC4560G	UPC4560	38
UPC4741C	UPC4741	38
UPC4741G	UPC4741	38
UPD4011BC	4011	1
UPD4011BG	4011	1

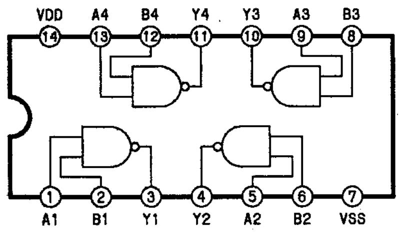
PART NO	REF. NO	REF. PAGE
UPD4012BG	4012	1
UPD4013BC	4013	1
UPD4015BC	4015	1
UPD4020BC	4020	2
UPD4021BC	4021	2
UPD4027BC	4027	2
UPD4028BG	4028	3
UPD4030BC	4030	3
UPD4040BC	4040	3
UPD4049UBC	4049	3
UPD4050BC	4050	3
UPD4050BG	4050	3
UPD4051BC	4051	4
UPD4052BC	4052	4
UPD4053BC	4053	4
UPD4053BG	4053	4
UPD4066BC	4066	5
UPD4066BC	4066	5
UPD4071BC	4071	5
UPD4071BG	4071	5
UPD4073BC	4073	5
UPD4081BC	4081	5
UPD4082BC	4082	5
UPD4094BC	4094	5
UPD41101	UPD41101C	39
UPD41101C1A	UPD41101C	39
UPD4175BG	4175	6
UPD42505C-50	UPD42505C-50	39
UPD4516BC	4516	6
UPD4528BG	4528	6
UPD4532BC	4532	6
UPD4538BC	4538	7
UPD4538BG	4538	7
UPD4584BC	4584	7
UPD4584BG	4584	7
UPD5200C	UPD5200C	39
UPD5200G	UPD5200C	39
UPD5201C	UPD5201C	39
UPD65010CW74	UPD65010CW74	40
UPD65012G150	UPD65012	40
UPD65022G046	UPD65022G046	41
UPD65040G144	UPD65040G144	41
UPD65042G024	UPD65042G024	41
UPD71054G	UPD71054G	42
UPD71054GB	UPD71054G	42
UPD71055G	UPD71055G	42
UPD71055GB	UPD71055G	42
UPD74HC123AG	74123	8
UPD74HCT244G	74244	13
UPD7503G597	UPD7503G	43
UPD780C	UPD780C	43
UPD7810CW	UPD7810CW	51
UPD78C10G	UPD78C10G	44
UPD78C10GD	UPD78C10G	44
UPD8253C	UPD8253C	52
UPD8255AC	UPD8255AC	52

PART NO	REF. NO	REF. PAGE
VCR0109	VCR0109	53
VCR0111	VCR0111	44
VCR0133	VCR0133	45
VCR0134	VCR0134	53
VCR0154	VCR0154	45
VCR0201	VCR0201	45
VSI0192	VSI0192	45
VSI0234	VSI0234	45
VSI0239	VSI0239	45
VSI0255	VSI0255	46
VSI0256	VSI0256	46
VSI0257	VSI0257	46
VSI0322	VSI0322	46
VSI0327A	VSI0327A	46

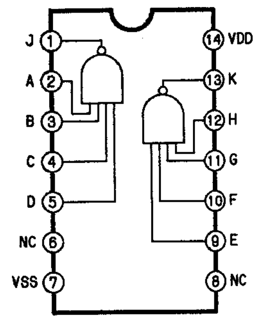
4001
(QUAD 2-INPUT NOR GATE)
(TOP VIEW)



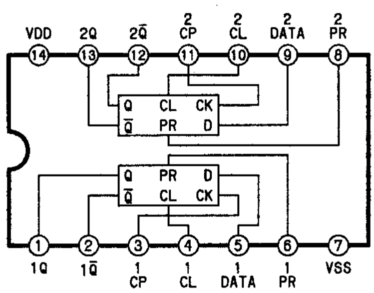
4011
(QUAD 2-INPUT NAND GATE)
(TOP VIEW)



4012
(DUAL 4-INPUT NAND GATE)
(TOP VIEW)



4013
(DUAL D-TYPE FLIP-FLOP)



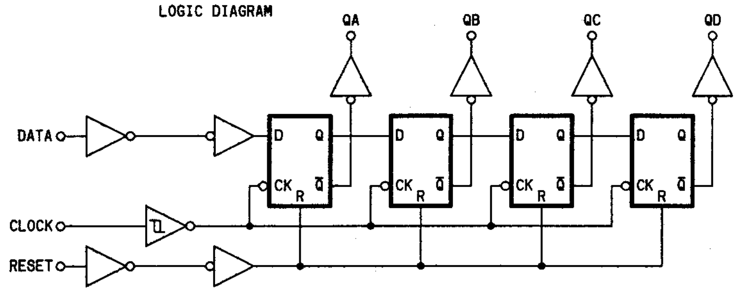
TRUTH TABLE

INPUTS				OUTPUTS		
CLOCK†	DATA	RESET	SET	Q	$\bar{Q}$	
↑	0	0	0	0	1	
↑	1	0	0	1	0	
↓	×	0	0	Q	$\bar{Q}$	NO CHANGE
×	×	1	0	0	1	
×	×	0	1	1	0	
×	×	1	1	1	1	

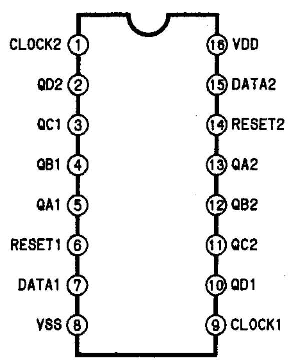
X=DON'T CARE
†=LEVEL CHANGE

4015
(DUAL 4-STAGE SHIFT REGISTER)

LOGIC DIAGRAM



(TOP VIEW)



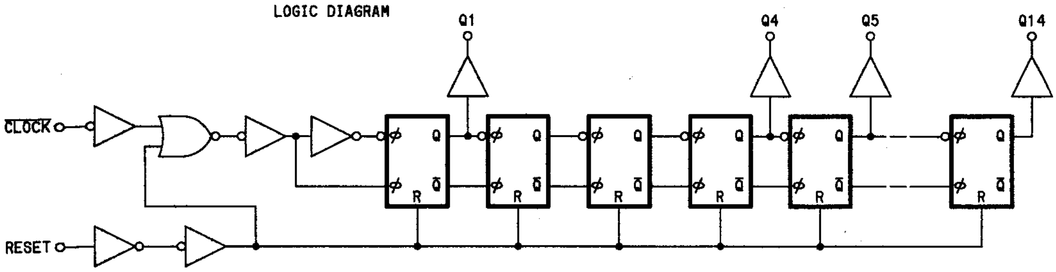
TRUTH TABLE

CL▲	D	R	Q1	QN
↑	0	0	0	QN-1
↑	1	0	1	QN-1
↓	×	0	Q1	QN (NO CHANGE)
×	×	1	0	0

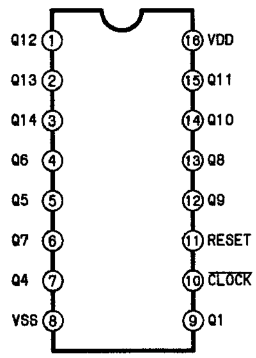
▲ LEVEL CHANGE
× DON'T CARE CASE

4020
(14-STAGE BINARY RIPPLE COUNTER)

LOGIC DIAGRAM



(TOP VIEW)



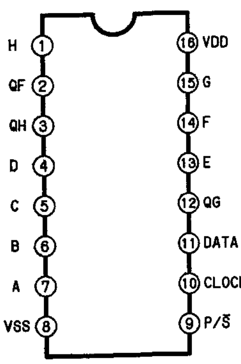
TRUTH TABLE

CLOCK	RESET	QN OUT
×	H	L
↑	L	NO COUNT
↓	L	BI COUNT

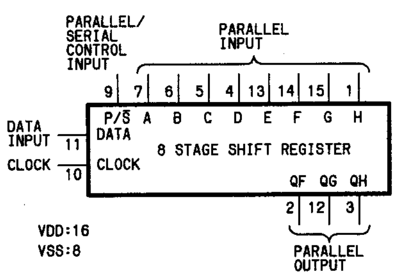
× DON'T CARE CASE

4021
(8-STAGE STATIC SHIFT REGISTER)

(TOP VIEW)



BLOCK DIAGRAM



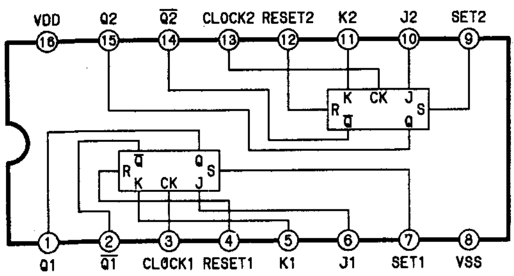
TRUTH TABLE

CL▲	SERIAL INPUT	PARALLEL/ SERIAL CONTROL	PL-1	PL-N	Q1 (INTERNAL)	QN	
×	×	1	0	0	0	0	
×	×	1	0	1	0	1	
×	×	1	1	0	1	0	
×	×	1	1	1	1	1	
↑	0	0	×	×	0	QN-1	
↑	1	0	×	×	1	QN-1	
↓	×	0	×	×	Q1	QN	NC

▲-LEVEL CHANGE ×-DON'T CARE CASE

4027
(DUAL J-K MASTER-SLAVE FLIP-FLOP)

(TOP VIEW)

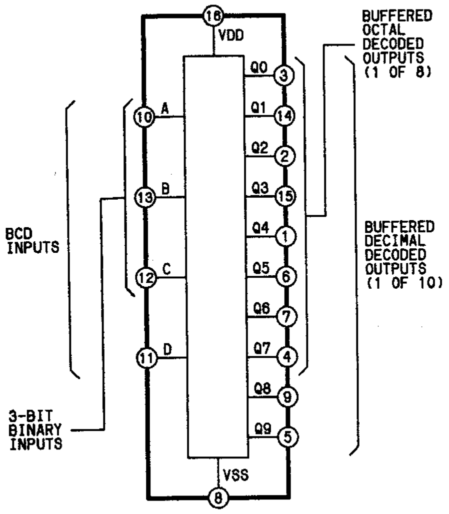


TRUTH TABLE

INPUT					OUTPUT	
C	J	K	S	R	QN+1	$\overline{QN+1}$
↑	L	L	L	L	QN	$\overline{QN}$
↑	L	H	L	L	L	H
↑	H	L	L	L	H	L
↑	H	H	L	L	$\overline{QN}$	QN
↓	×	×	L	L	QN	$\overline{QN}$
×	×	×	L	H	L	H
×	×	×	H	L	H	L
×	×	×	H	H	H	H

×-DON'T CARE CASE

4028
(BCD-TO-DECIMAL DECODER)
(TOP VIEW)

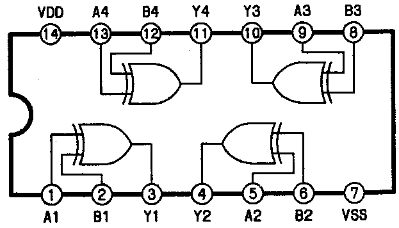


TRUTH TABLE

D	C	B	A	0	1	2	3	4	5	6	7	8	9
0	0	0	0	1	0	0	0	0	0	0	0	0	0
0	0	0	1	0	1	0	0	0	0	0	0	0	0
0	0	1	0	0	0	1	0	0	0	0	0	0	0
0	0	1	1	0	0	0	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	1	0	0	0	0	0
0	1	0	1	0	0	0	0	0	1	0	0	0	0
0	1	1	0	0	0	0	0	0	0	1	0	0	0
0	1	1	1	0	0	0	0	0	0	0	1	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1	0
1	0	0	1	0	0	0	0	0	0	0	0	0	1
1	0	1	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	1	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	0	0	0

1-HIGH LEVEL 0-LOW LEVEL

4030
(QUAD EXCLUSIVE OR GATE)
(TOP VIEW)

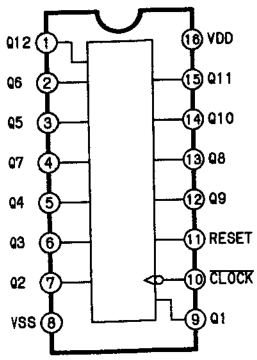


TRUTH TABLE

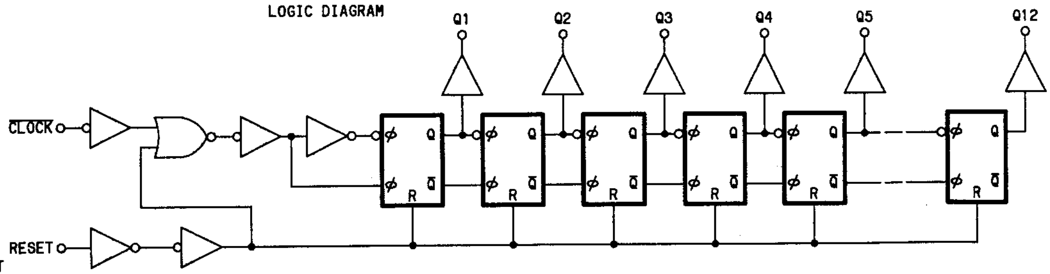
A	B	Y
L	L	L
H	L	H
L	H	H
H	H	L

4040
(12-STAGE RIPPLE CARRY BINARY COUNTER/DIVIDER)

(TOP VIEW)



LOGIC DIAGRAM

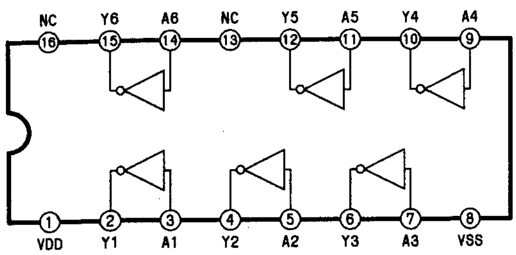


TRUTH TABLE

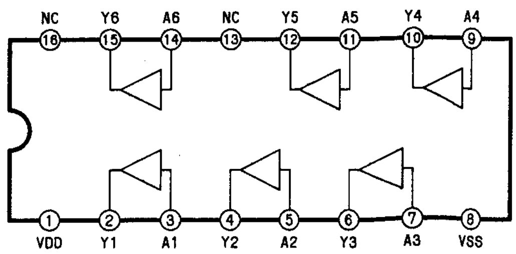
CLOCK	RESET	QN OUT
×	H	L
↑	L	NO COUNT
↓	L	BI COUNT

×: H or L

4049
(HEX.INVERTING BUFFER/CONVERTER)
(TOP VIEW)

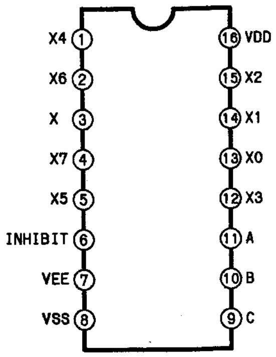


4050
(HEX.BUFFER/CONVERTER)
(TOP VIEW)



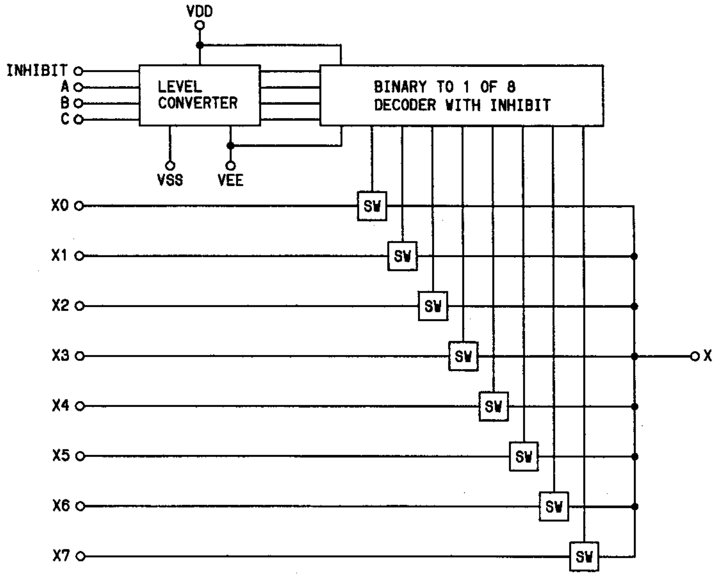
4051
(SINGLE 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER)

(TOP VIEW)



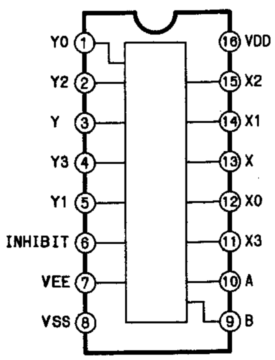
TRUTH TABLE

INPUT STATES				"ON"CHANNEL(S)
INHIBIT	C	B	A	
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	×	×	×	NONE



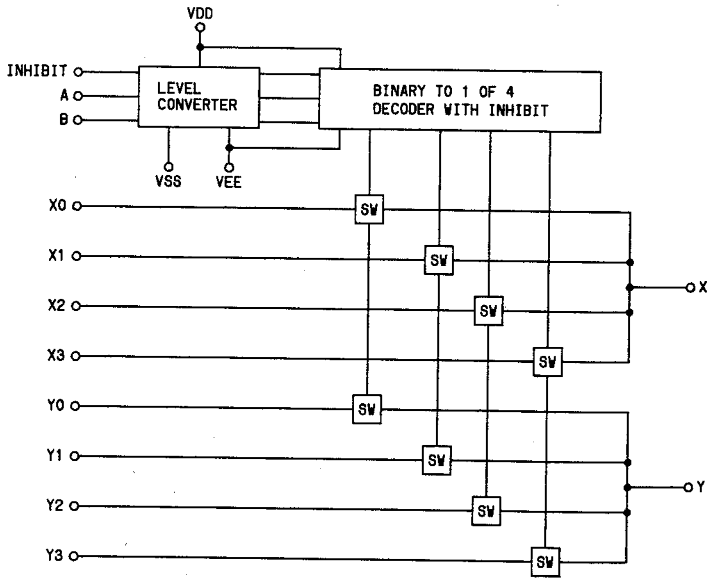
4052
(DIFFERENTIAL 4-CHANNEL MULTIPLEXER/DEMULTIPLEXER)

(TOP VIEW)



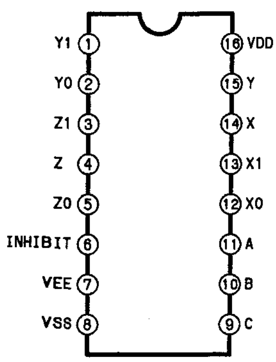
TRUTH TABLE

INPUT STATES			"ON"CHANNEL(S)
INHIBIT	B	A	
0	0	0	X0.Y0
0	0	1	X1.Y1
0	1	0	X2.Y2
0	1	1	X3.Y3
1	×	×	NONE



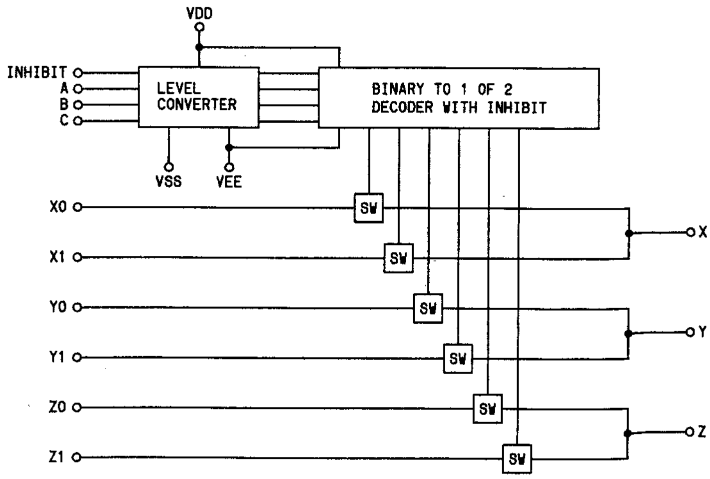
4053
(TRIPLE 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER)

(TOP VIEW)

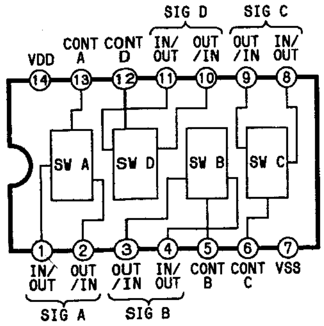


TRUTH TABLE

INPUT STATES				"ON"CHANNEL(S)
INHIBIT	C	B	A	
0	0	0	0	X0.Y0.Z0
0	0	0	1	X1.Y1.Z1
1	×	×	×	NONE



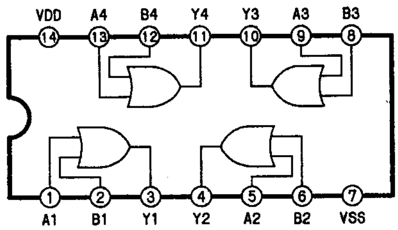
4066
(QUAD BILATERAL SWITCH)
(TOP VIEW)



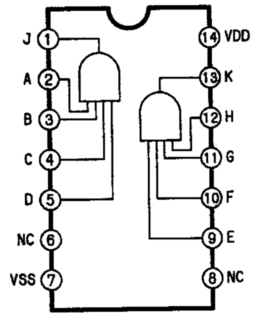
TRUTH TABLE

CONTROL	SWITCH
H	ON
L	OFF

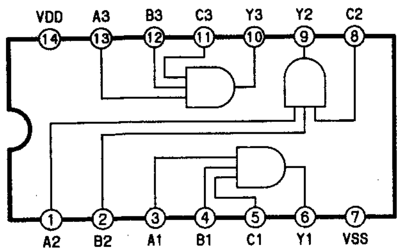
4071
(QUAD 2-INPUT OR GATE)
(TOP VIEW)



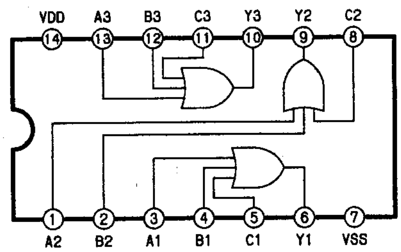
4082
(DUAL 4-INPUT AND GATE)
(TOP VIEW)



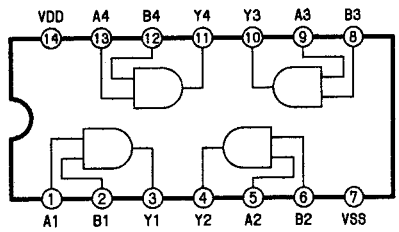
4073
(TRIPLE 3-INPUT AND GATE)
(TOP VIEW)



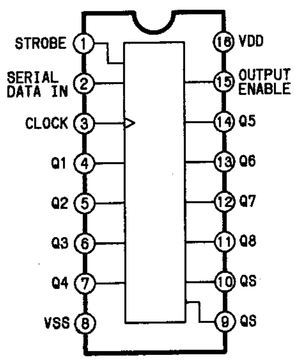
4075
(TRIPLE 3-INPUT OR GATE)
(TOP VIEW)



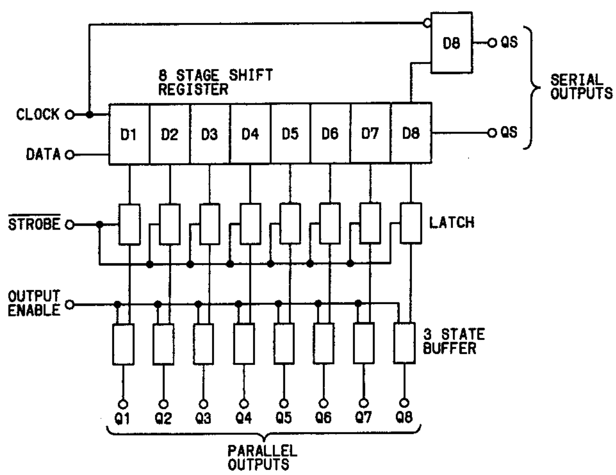
4081
(QUAD 2-INPUT AND GATE)
(TOP VIEW)



4094
(8-STAGE SHIFT/STORE BUS REGISTER)
(TOP VIEW)



BLOCK DIAGRAM

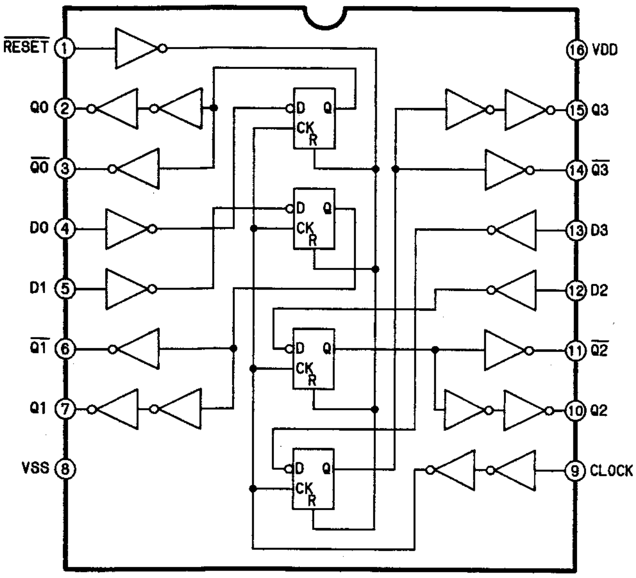


TRUTH TABLE

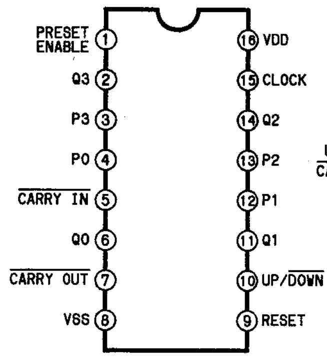
CL▲	OUTPUT ENABLE	STROBE	DATA	PARALLEL OUTPUTS Q1	PARALLEL OUTPUTS QN	SERIAL OUTPUTS QS	SERIAL OUTPUTS Q'S
↑	0	×	×	OC	OC	Q7	NC
↓	0	×	×	OC	OC	NC	Q7
↑	1	0	×	NC	NC	Q7	NC
↑	1	1	0	0	QN-1	Q7	NC
↑	1	1	1	1	QN-1	Q7	NC
↓	1	1	1	NC	NC	NC	Q7

▲= LEVEL CHANGE ×= DON'T CARE CASE

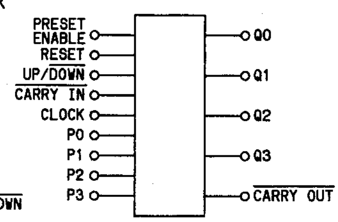
4175
(QUAD D-TYPE FLIP-FLOP)



4516
(4-BIT UP/DOWN BINARY COUNTER)
(TOP VIEW)



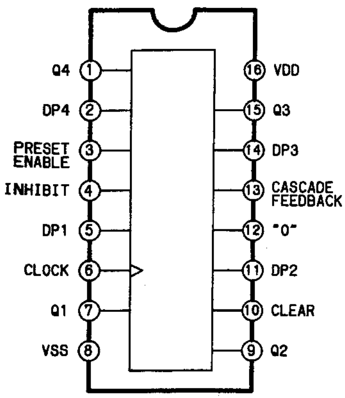
BLOCK DIAGRAM



TRUTH TABLE

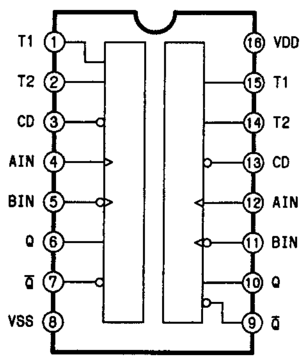
CARRY IN	UP/DOWN	PRESET ENABLE	RESET	ACTION
H	×	L	L	NO COUNT
L	H	L	L	COUNT UP
L	L	L	L	COUNT DOWN
×	×	H	L	PRESET
×	×	×	H	RESET

4526
(PROGRAMMABLE DIVIDE-BY-N 4-BIT COUNTER)
(TOP VIEW)



CLOCK	INHIBIT	PRESET ENABLE	MASTER RESET	ACTION
0	0	0	0	NO COUNT
X	0	0	0	COUNT1
↑	I	0	0	NO COUNT
I	↓	0	0	COUNT1
X	X	I	0	PRESET
X	X	X	I	RESET

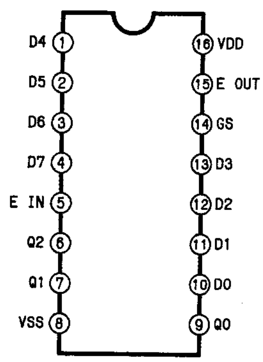
4528
(DUAL MONOSTABLE MULTIVIBRATOR)
(TOP VIEW)



TRUTH TABLE

INPUT			OUTPUT	
A	B	CD	Q	$\overline{Q}$
↑	H	H	⎍	⊔
↑	L	H	Q	$\overline{Q}$
H	↓	H	Q	$\overline{Q}$
L	↓	H	⎍	⊔
×	×	L	L	H

4532
(8-BIT PRIORITY ENCODER)
(TOP VIEW)

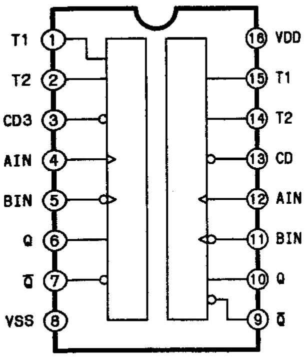


TRUTH TABLE

INPUT									OUTPUT				
E IN	D7	D6	D5	D4	D3	D2	D1	D0	GS	Q2	Q1	Q0	E OUT
L	×	×	×	×	×	×	×	×	L	L	L	L	L
H	L	L	L	L	L	L	L	L	L	L	L	L	H
H	H	×	×	×	×	×	×	×	H	H	H	H	L
H	L	H	×	×	×	×	×	×	H	H	H	L	L
H	L	L	H	×	×	×	×	×	H	H	L	H	L
H	L	L	L	H	×	×	×	×	H	H	L	L	L
H	L	L	L	L	H	×	×	×	H	L	H	H	L
H	L	L	L	L	L	H	×	×	H	L	H	L	L
H	L	L	L	L	L	L	H	×	H	L	L	H	L
H	L	L	L	L	L	L	L	H	H	L	L	L	L

4538
(DUAL PRECISION MONOSTABLE MULTIVIBRATOR)

(TOP VIEW)

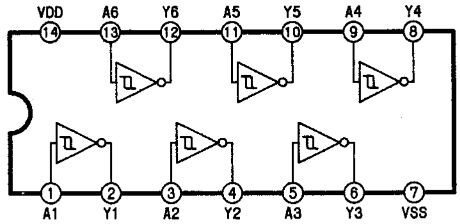


TRUTH TABLE

INPUT			OUTPUT	
A	$\overline{B}$	$\overline{CD}$	Q	$\overline{Q}$
↑	H	H	⊓	⊔
↑	L	H	Q	$\overline{Q}$
H	↓	H	Q	$\overline{Q}$
L	↓	H	⊓	⊔
×	×	L	L	H

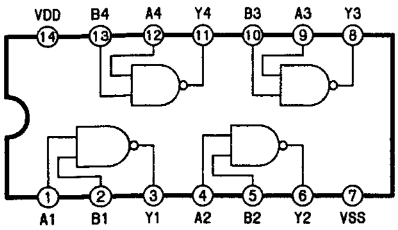
4584
(HEX.SCHMITT TRIGGER)

(TOP VIEW)



7400
(QUAD 2-INPUT NAND GATE)

(TOP VIEW)

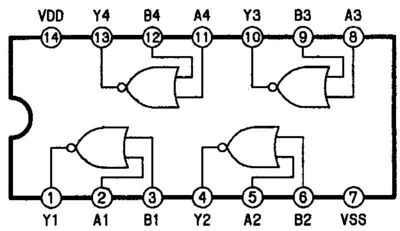


TRUTH TABLE (74HC)

INPUTS		OUTPUTS
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

7402
(QUAD 2-INPUT NOR GATE)

(TOP VIEW)

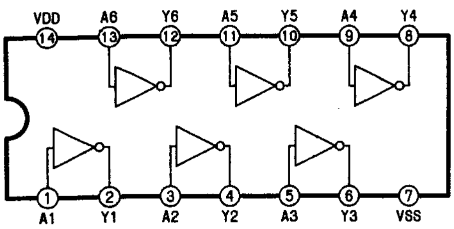


TRUTH TABLE

INPUTS		OUTPUTS
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

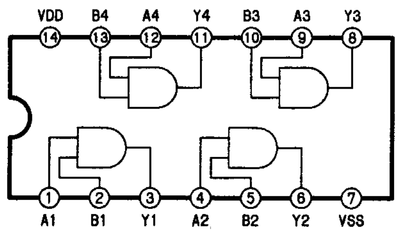
7404
(HEX.INVERTER)

(TOP VIEW)



7408
(QUAD 2-INPUT AND GATE)

(TOP VIEW)

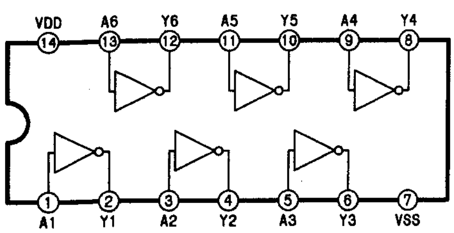


TRUTH TABLE

INPUTS		OUTPUTS
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

7406
(HEX.INVERTER)

(TOP VIEW)

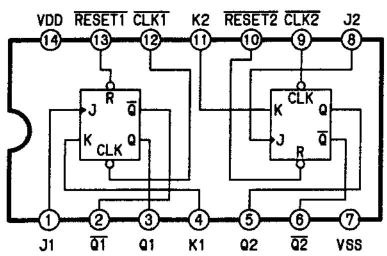


74107
(DUAL J-K FLIP-FLOP WITH CLEAR)

(TOP VIEW)

$\overline{CLK1}$:$\overline{CLOCK1}$

$\overline{CLK2}$:$\overline{CLOCK2}$



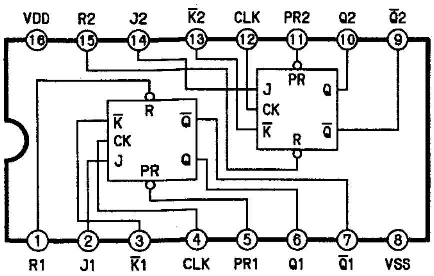
TRUTH TABLE

INPUT				OUTPUT	
$\overline{RESET}$	$\overline{CLOCK}$	J	K	Q	$\overline{Q}$
L	×	×	×	L	H
H	↓	L	L	NO CHANGE	
H	↓	L	H	L	H
H	↓	H	L	H	L
H	↓	H	H	TOGGLE	
H	L or H	×	×	NO CHANGE	
H	↑	×	×	NO CHANGE	

×=H or L

74109

(DUAL J-K FLIP-FLOP WITH PRESET AND CLEAR)



CLK:CLOCK

$\overline{PR}$:$\overline{PRESET}$

$\overline{R}$:$\overline{RESET}$

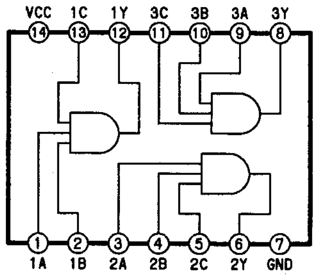
TRUTH TABLE (74HC109)

INPUTS					OUTPUTS	
PR	CLR	CLK	J	$\overline{K}$	Q	$\overline{Q}$
L	H	×	×	×	H	L
H	L	×	×	×	L	H
L	L	×	×	×	H*	H*
H	H	↑	L	L	L	H
H	H	↑	H	L	TOGGLE	
H	H	↑	L	H	Q0	$\overline{Q0}$
H	H	↑	H	H	H	L
H	H	L	×	×	Q0	$\overline{Q0}$

* :UNSTABLE

7411

(TRIPLE 3-INPUT AND GATE)

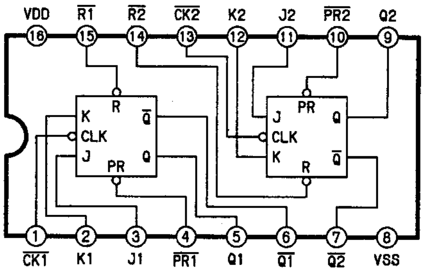


Y=A B C

74112

(DUAL J-K FLIP-FLOP WITH PRESET AND CLEAR)

(TOP VIEW)



CLK:CLOCK

$\overline{PR}$:$\overline{PRESET}$

$\overline{R}$:$\overline{RESET}$

TRUTH TABLE (74HC112)

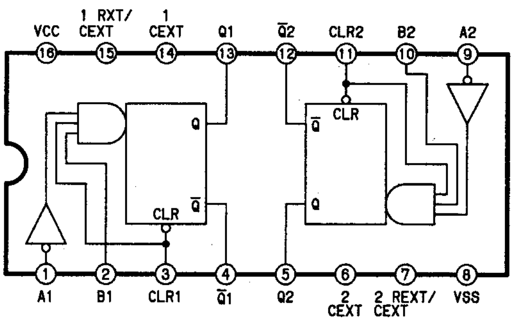
INPUTS					OUTPUTS	
PR	CLR	CLK	J	L	Q	$\overline{Q}$
L	H	×	×	×	H	L
H	L	×	×	×	L	H
L	L	×	×	×	L*	L*
H	H	↓	L	L	Q0	$\overline{Q0}$
H	H	↓	H	L	H	L
H	H	↓	L	H	L	H
H	H	↓	H	H	TOGGLE	
H	H	H	×	×	Q0	$\overline{Q0}$

* :UNSTABLE

74123

(DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR)

(TOP VIEW)



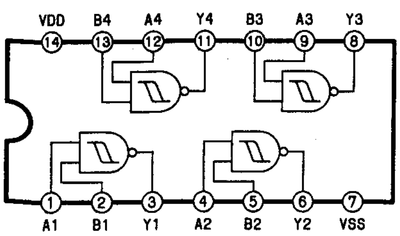
TRUTH TABLE

INPUTS			OUTPUTS	
CLEAR	A	B	Q	$\overline{Q}$
L	×	×	L	H
×	H	×	L	H
×	×	L	L	H
H	L	↑	⎍	⊔
H	↓	H	⎍	⊔
↑	L	H	⎍	⊔

74132

(QUAD 2-INPUT NAND SCHMITT TRIGGER)

(TOP VIEW)



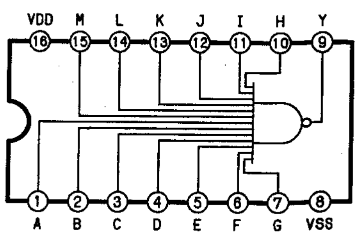
TRUTH TABLE

INPUTS		OUTPUTS
A	B	Y
0	0	1
1	0	1
0	1	1
1	1	0

74133

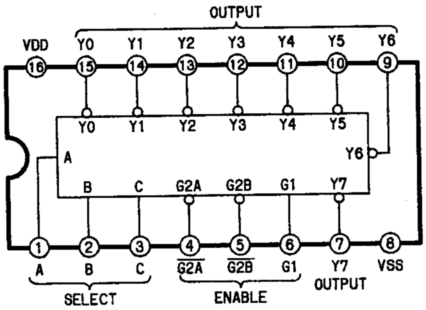
(13-INPUT NAND GATE)

(TOP VIEW)



Y=$\overline{A B C D E F G H I J K L M}$

74138
(3-TO-8 LINE DECODER)
(TOP VIEW)

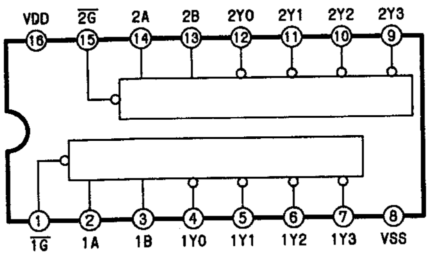


TRUTH TABLE (74HC138)

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	$\overline{G2}$•	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
×	H	×	×	×	H	H	H	H	H	H	H	H
L	×	×	×	×	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

• $\overline{G2}=\overline{G2A}+\overline{G2B}$

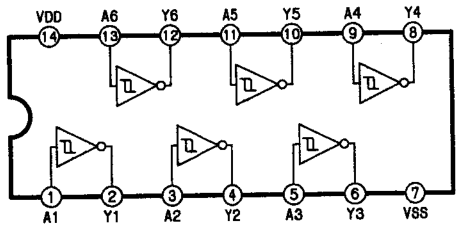
74139
(DUAL 2-TO-4 LINE DECODER)
(TOP VIEW)



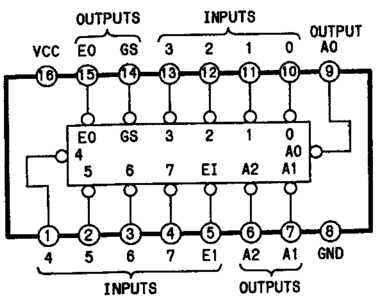
TRUTH TABLE

INPUTS			OUTPUTS			
ENABLE	SELECT					
G	B	A	Y0	Y1	Y2	Y3
H	×	×	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

7414
(HEX.INVERTING SCHMITT TRIGGER)
(TOP VIEW)



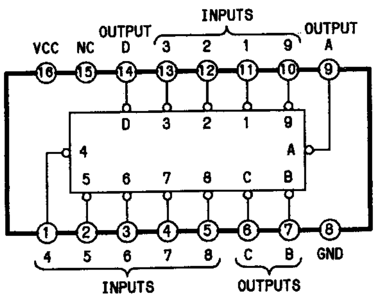
74148
(8-TO-3 LINE PRIORITY ENCODER)
(TOP VIEW)



TRUTH TABLE

INPUTS									OUTPUTS				
E1	0	1	2	3	4	5	6	7	A2	A1	A0	GS	E0
H	X	X	X	X	X	X	X	X	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	L
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	X	X	X	X	X	X	L	H	L	L	H	L	H
L	X	X	X	X	X	L	H	H	L	H	L	L	H
L	X	X	X	X	L	H	H	H	L	H	H	L	H
L	X	X	X	L	H	H	H	H	H	L	L	L	H
L	X	X	L	H	H	H	H	H	H	L	H	L	H
L	X	L	H	H	H	H	H	H	H	H	L	L	H
L	L	H	H	H	H	H	H	H	H	H	H	L	H

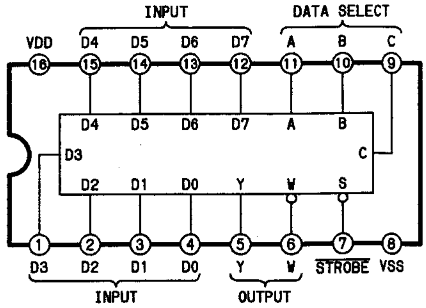
74147
(10-TO-4 LINE PRIORITY ENCODER)
(TOP VIEW)



FUNCTION TABLE

INPUTS									OUTPUTS			
1	2	3	4	5	6	7	8	9	D	C	B	A
H	H	H	H	H	H	H	H	H	H	H	H	H
X	X	X	X	X	X	X	X	L	L	H	H	L
X	X	X	X	X	X	X	L	H	L	H	H	H
X	X	X	X	X	X	L	H	H	H	L	L	L
X	X	X	X	X	L	H	H	H	H	L	L	H
X	X	X	X	L	H	H	H	H	H	L	H	L
X	X	X	L	H	H	H	H	H	H	L	H	H
X	X	L	H	H	H	H	H	H	H	H	L	L
X	L	H	H	H	H	H	H	H	H	H	L	H
L	H	H	H	H	H	H	H	H	H	H	H	L

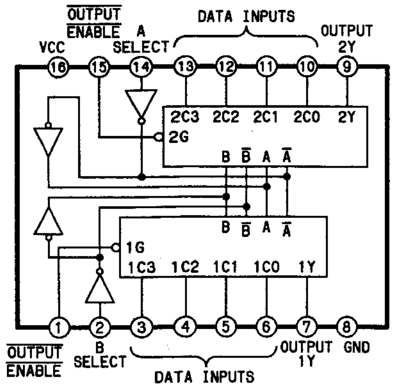
74151
(8-CHANNEL DIGITAL MULTIPLEXER)
(TOP VIEW)



TRUTH TABLE

INPUTS				OUTPUTS	
SELECT			STROBE		
C	B	A	S	Y	W
×	×	×	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

74153
(DUAL 4-INPUT MULTIPLEXER)

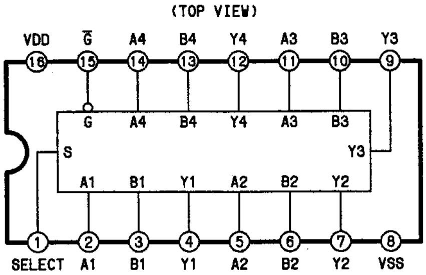


TRUTH TABLE

INPUT			OUTPUT
SELECT		OUTPUT ENABLE	Y
B	A		
×	×	H	L
L	L	L	D0
L	H	L	D1
H	L	L	D2
H	H	L	D3

H:HIGH L:LOW X:H or L

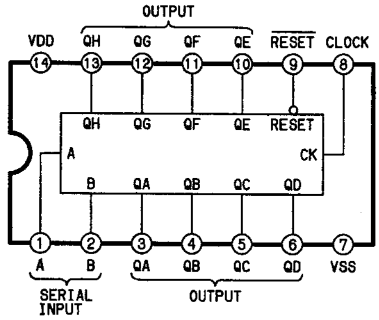
74157
(QUAD 2-INPUT MULTIPLEXER)



TRUTH TABLE (74HC157)

INPUTS				OUTPUT Y
STROBE	SELECT	A	B	HC157
H	×	×	×	L
L	L	L	×	L
L	L	H	×	H
L	H	×	L	L
L	H	×	H	H

74164
(8-BIT SERIAL-IN/PARALLEL-OUT SHIFT REGISTER)

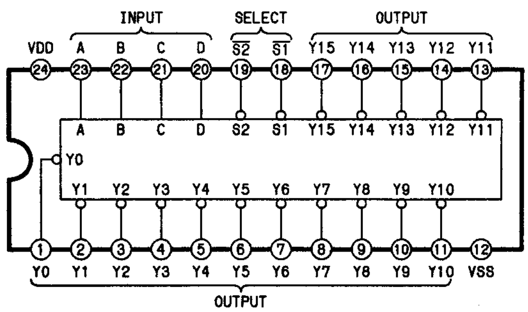


TRUTH TABLE (74HC164)

INPUT				OUTPUT		
RESET	CLOCK	A	B	QA	QB	QH
L	×	×	×	L	L	L
H	↓	×	×	NO CHANGE		
H	↑	L	×	L	QA	QG
H	↑	×	L	L	QA	QG
H	↑	H	H	H	QA	QG

H:HIGH L:LOW X:H or L

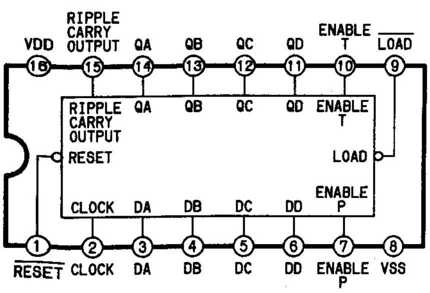
74154
(4-TO-16 LINE DECODER)



TRUTH TABLE (74HC154)

INPUTS						LOW OUTPUT
G1	G2	D	C	B	A	
L	L	L	L	L	L	0
L	L	L	L	L	H	1
L	L	L	L	H	L	2
L	L	L	L	H	H	3
L	L	L	H	L	L	4
L	L	L	H	L	H	5
L	L	L	H	H	L	6
L	L	L	H	H	H	7
L	L	H	L	L	L	8
L	L	H	L	L	H	9
L	L	H	L	H	L	10
L	L	H	L	H	H	11
L	L	H	H	L	L	12
L	L	H	H	L	H	13
L	L	H	H	H	L	14
L	L	H	H	H	H	15
L	H	×	×	×	×	—
H	L	×	×	×	×	—
H	H	×	×	×	×	—

74161
(4-BIT SYNCHRONOUS BINARY COUNTER)



TRUTH TABLE (74HC160/74HC161)

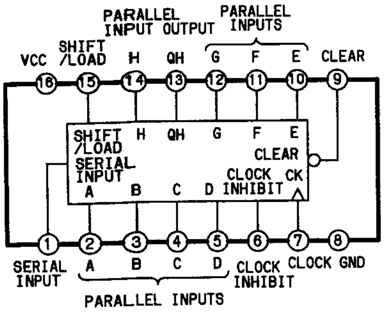
INPUT					OUTPUT
CLOCK	RESET	LOAD	ENABLE P	ENABLE T	Qn
×	L	×	×	×	L
↑	H	L	×	×	LOAD
↑	H	H	H	H	COUNT
×	H	H	L	×	NO COUNT
×	H	H	×	L	NO COUNT

H:HIGH L:LOW X:H or L
n:A∼D

FUNCTION TABLE (74161)

INPUT					OUTPUT		FUNCTION
CLEAR	LOAD	CK	ENABLE P	ENABLE T	QA QB QC QD	RIPPLE CARRY	
H	H	↑	H	H		—	COUNT
H	L	↑	X	X	DA DB DC DD	—	DATA SET
↓	X	X	X	X	L L L L	—	CLEAR
H	X	X	X	H	H H H H	H	—

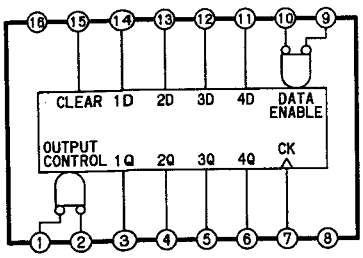
74166
(8-BIT SHIFT REGISTER)



TRUTH TABLE

INPUT				FUNCTION
CLEAR	SHIFT/LOAD	CK	CK INHIBIT	
H	H		L	RIGHT SHIFT
H	L		L	LOAD
H	H	X	H	HOLD
	X	X	X	CLEAR

74173
(3-STATE QUAD D-TYPE FLIP-FLOP)



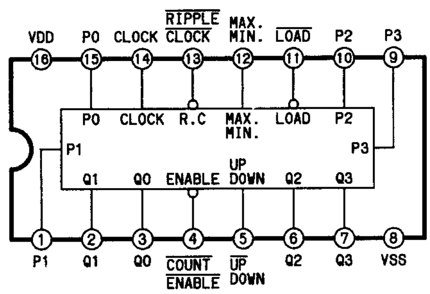
TRUTH TABLE (74HC173)

INPUTS					OUTPUT Q
CLEAR	CLOCK	DATA ENABLE G1	DATA ENABLE G2	DATA D	
H	×	×	×	×	L
L	L	×	×	×	Q0
L	↑	H	×	×	Q0
L	↑	×	H	×	Q0
L	↑	L	L	L	L
L	↑	L	L	H	H

WHEN EITHER M or N(or BOTH) IS(ARE) HIGH THE OUTPUT IS DISABLED TO THE HIGH-IMPEDANCE STATE:HOWEVER, SEQUENTIAL OPERATION OF THE FLIP-FLOPS IS NOT AFFECTED.

74191
(4-BIT SYNCHRONOUS BINARY UP/DOWN COUNTER WITH MODE CONTROL)

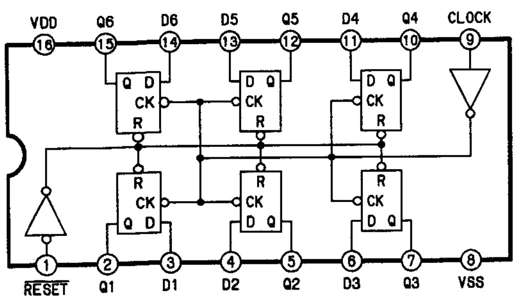
(TOP VIEW)



P0～P3:PRESET.DATA INPUT
Q0～Q3:OUTPUT

74174
(HEX.D-TYPE FLIP-FLOP WITH CLEAR)

(TOP VIEW)

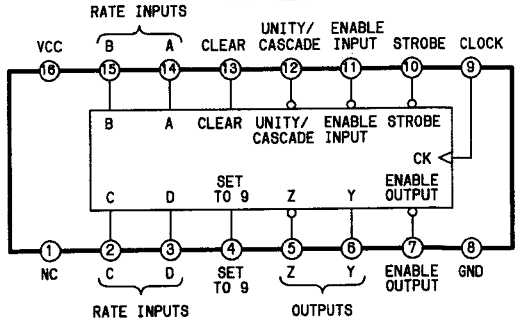


TRUTH TABLE (74HC174)

INPUTS			OUTPUTS
CLEAR	CLOCK	D	Q
L	×	×	L
H	↑	H	H
H	↑	L	L
H	L	×	Q0

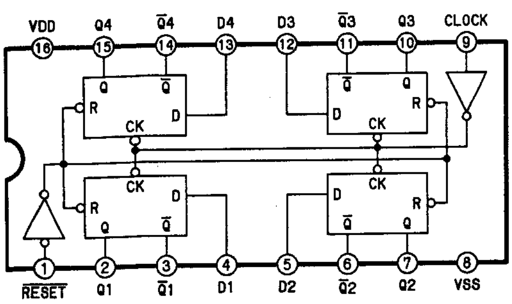
74167
(BCD SYNCHRONOUS RATE MULTIPLIERS)

(TOP VIEW)



74175
(QUAD D-TYPE FLIP-FLOP WITH CLEAR)

(TOP VIEW)



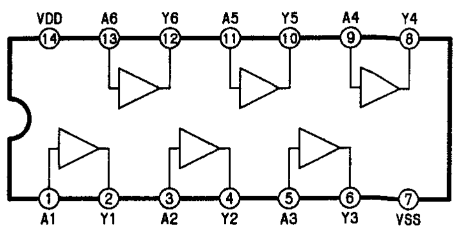
TRUTH TABLE (74HC175)

INPUT			OUTPUT	
CLOCK	RESET	D	Q	Q̄
×	L	×	L	H
↑	H	H	H	L
↑	H	L	L	H
L	H	×	NO CHANGE	

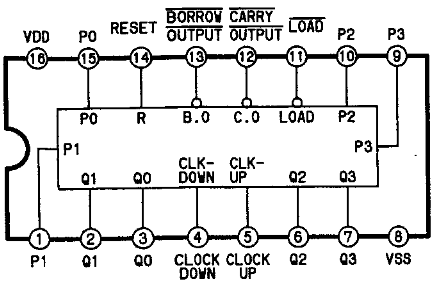
H:HIGH L:LOW X:H or L

7417
(HEX.O.C.BUFFER)

(TOP VIEW)



74193
(4-BIT SYNCHRONOUS BINARY UP/DOWN COUNTER)
(TOP VIEW)

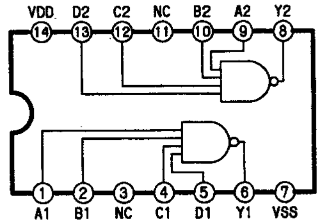


TRUTH TABLE

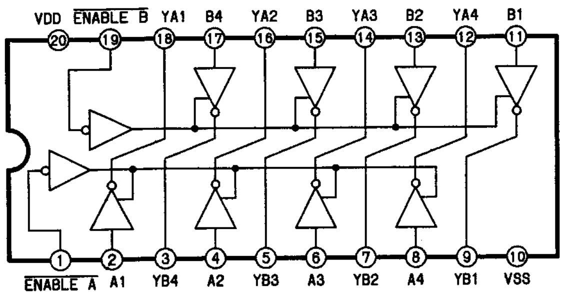
COUNT		CLEAR	LOAD	FUNCTION
UP	DOWN			
↑	H	L	H	COUNT UP
H	↑	L	H	COUNT DOWN
×	×	H	×	CLEAR
×	×	L	L	LOAD

P0∼P3 PRESET INPUT
Q0∼Q3 BINARY OUTPUT

7420
(DUAL 4-INPUT NAND GATE)
(TOP VIEW)



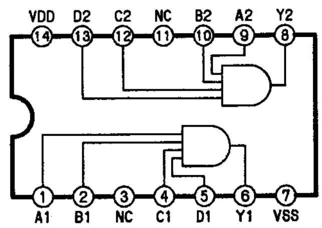
74240
(INVERTING OCTAL 3-STATE BUFFER)
(TOP VIEW)



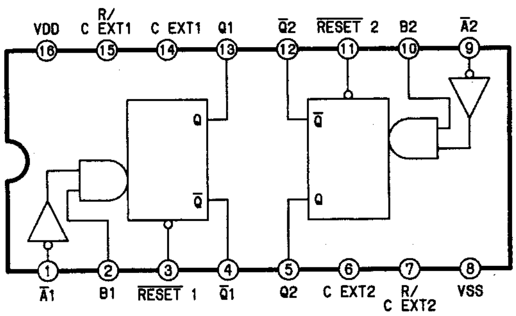
TRUTH TABLE (74HC240)

$1\overline{G}$	1A	1Y	$2\overline{G}$	2A	2Y
L	L	H	L	L	H
L	H	L	L	H	L
H	L	Z	H	L	Z
H	H	Z	H	H	Z

7421
(DUAL 4-INPUT AND GATE)
(TOP VIEW)



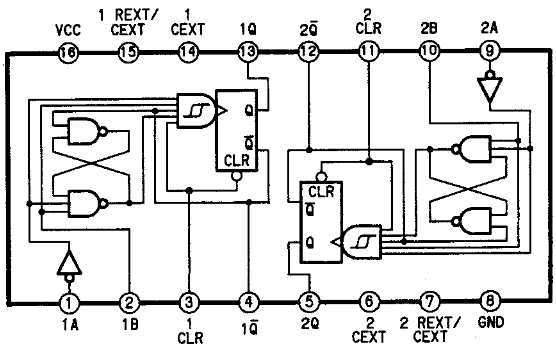
74221
(DUAL NON-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR)
(TOP VIEW)



(74HC221)

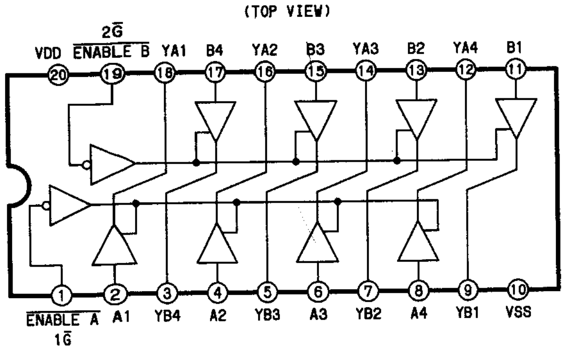
TRUTH TABLE (74HC221)

INPUTS			OUTPUTS	
CLEAR	A	B	Q	$\overline{Q}$
L	×	×	L	H
×	H	×	L	H
×	×	L	L	H
H	L	↑	⎍	⊔
H	↓	H	⎍	⊔
↑	L	H	⎍	⊔



(74221)

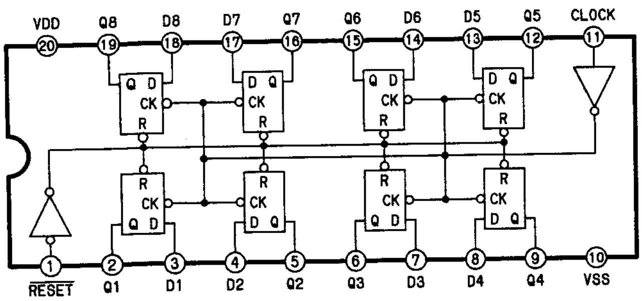
74244
(OCTAL 3-STATE BUFFER)



TRUTH TABLE (74HC244)

1G	1A	1Y	2G	2A	2Y
L	L	L	L	L	L
L	H	H	L	H	H
H	L	Z	H	L	Z
H	H	Z	H	H	Z

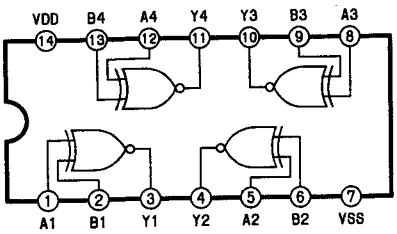
74273
(OCTAL D-TYPE FLIP-FLOP WITH CLEAR)



TRUTH TABLE (74HC273)

INPUTS			OUTPUTS
CLEAR	CLOCK	D	Q
L	×	×	L
H	↑	H	H
H	↑	L	L
H	L	×	Q0

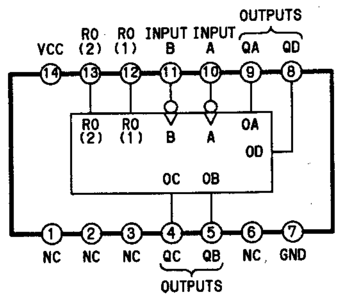
74266
(QUAD 2-INPUT EXCLUSIVE NOR GATE)



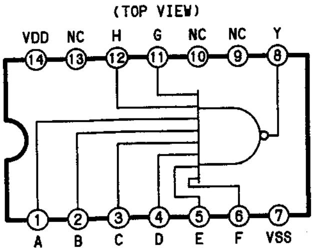
TRUTH TABLE

INPUTS		OUTPUTS
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	H

74293
(BINARY COUNTER)

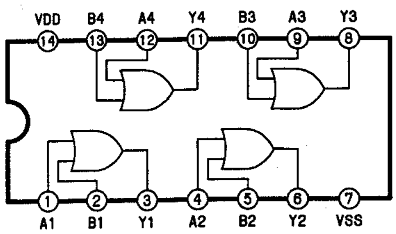


7430
(8-INPUT NAND GATE)

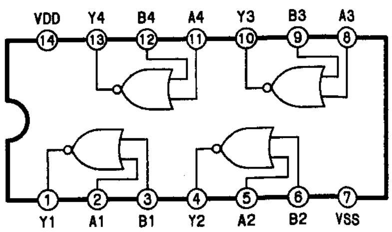


$Y = \overline{ABCDEFGH}$

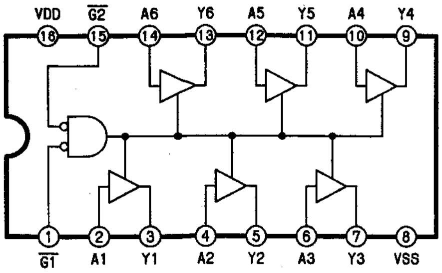
7432
(QUAD 2-INPUT OR GATE)



7433
(QUAD 2-INPUT O.C.NOR BUFFER)



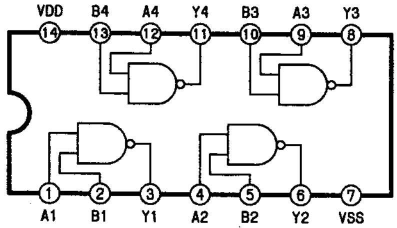
74365
(HEX.3-STATE BUFFER)
(TOP VIEW)



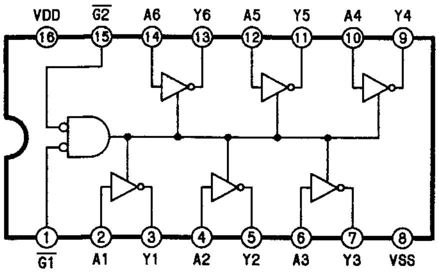
TRUTH TABLE (74HC365)

INPUTS			OUTPUT
$\overline{G1}$	$\overline{G2}$	A	Y
H	×	×	Z
×	H	×	Z
L	L	H	H
L	L	L	L

7438
(QUAD 2-INPUT O.C.NAND BUFFER)
(TOP VIEW)



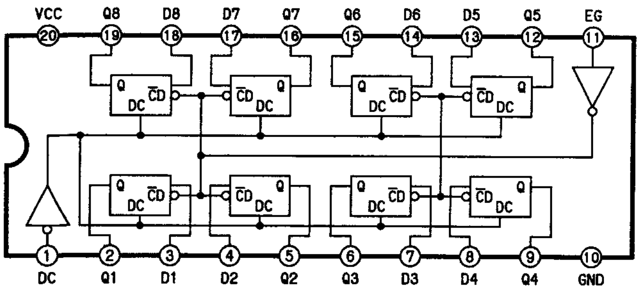
74366
(INVERTING HEX.3-STATE BUFFER)
(TOP VIEW)



TRUTH TABLE (74HC366)

INPUTS			OUTPUT
$\overline{G1}$	$\overline{G2}$	A	Y
H	×	×	Z
×	H	×	Z
L	L	H	L
L	L	L	H

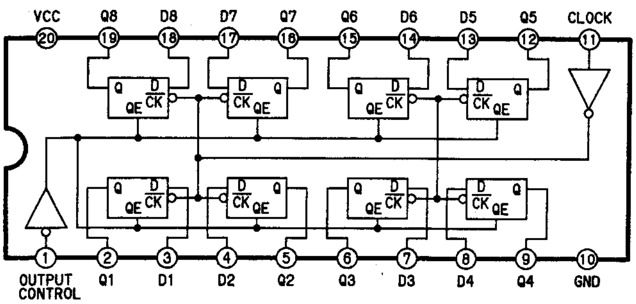
74373
(3-STATE OCTAL D-TYPE LATCH)



TRUTH TABLE (74HC373)

OUTPUT CONTROL DC	LATCH ENABLE EG	DATA	OUTPUT
L	H	H	H
L	H	L	H
L	L	×	Q0
H	×	×	Z

74374
(3-STATE OCTAL D-TYPE FLIP-FLOP)
(TOP VIEW)



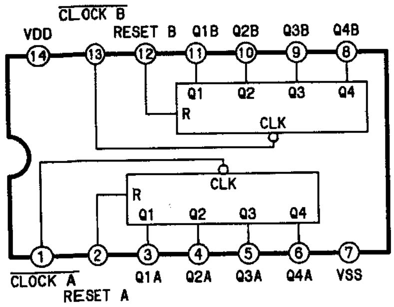
TRUTH TABLE (74HC374)

OUTPUT CONTROL	CLOCK	DATA	OUTPUT
L	↑	H	H
L	↑	L	L
L	L	×	Q0
H	×	×	Z

FUNCTION TABLE (74374)

INPUT		FUNCTION
OUTPUT CTL	CK	
×	⎍	DATA SET
H	×	HIGH IMPE OUT

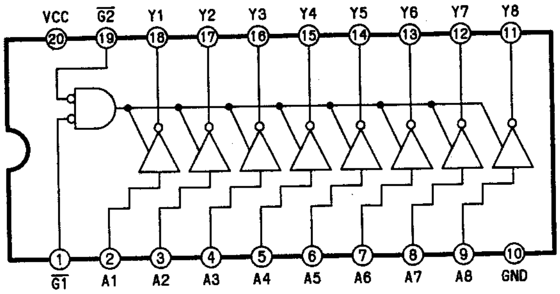
74393
(DUAL 4-BIT BINARY COUNTER)
(TOP VIEW)



TRUTH TABLE (74HC393)

INPUTS		FUNCTION
CLOCK	CLEAR	
↓	L	INCREMENT
×	H	CLEAR

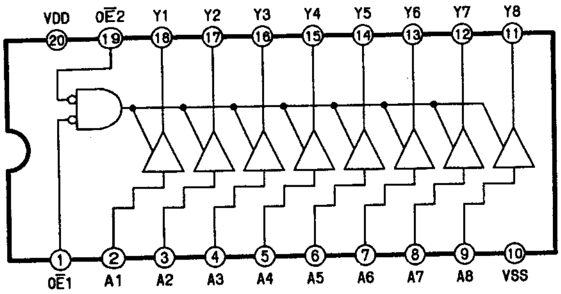
74540
(INVERTING OCTAL 3-STATE BUFFER)



TRUTH TABLE

INPUT		OUTPUT
E1	E2	
L	L	D
H	×	HIGH Z
×	H	HIGH Z

74541
(OCTAL 3-STATE BUFFER) (TOP VIEW)



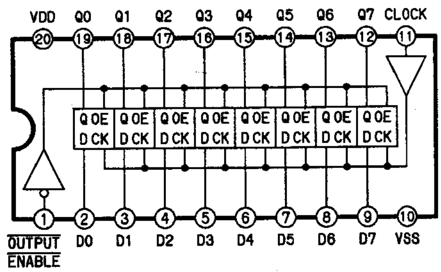
$\overline{\text{OE}}$1, $\overline{\text{OE}}$2: $\overline{\text{OUTPUT ENABLE}}$

TRUTH TABLE

INPUT			OUTPUT
$\overline{\text{OE}}$1	$\overline{\text{OE}}$2	A	Y
L	L	L	L
L	L	H	H
H	×	×	Z
×	H	×	Z

X:H or L Z:HIGH IMPEDANCE

74574
(OCTAL D-TYPE FLIP-FLOP)
(TOP VIEW)

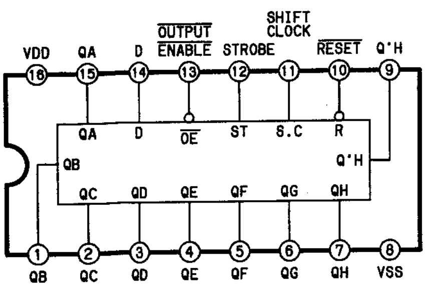


TRUTH TABLE (74HC574)

INPUT			OUTPUT
$\overline{\text{OUTPUT ENABLE}}$	CLOCK	DATA D	Q
L	↑	H	H
L	↑	L	L
L	↓	×	NO CHANGE
H	×	×	Z

X:H or L Z:HIGH IMPEDANCE

74595
(8-BIT SHIFT REGISTER WITH OUTPUT LATCH)
(TOP VIEW)

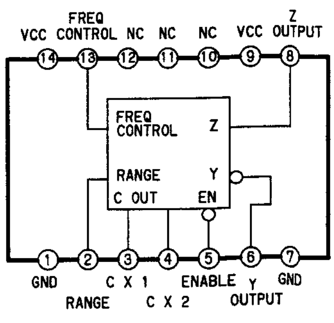


QA~QH:PARALLEL OUTPUTS
Q'H :SERIAL OUTPUT

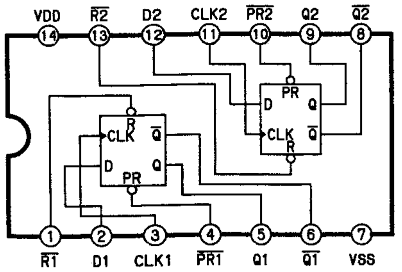
TRUTH TABLE (74HC595)

RCK	SCK	$\overline{\text{SCLR}}$	$\overline{\text{G}}$	FUNCTION
×	×	×	1	QA THRU QH-TRI-STATE
×	×	L	×	SHIFT REGISTER CLEARED QH'=0
×	↑	H	×	SHIFT REGISTER CLOCKED QN=Qn-1,Q0=SER
↑	×	H	×	CONTENTS OF SHIFT REGISTER TRANSFERRED TO OUTPUT LATCHES

74624
(VCO)



7474
(DUAL D-TYPE FLIP-FLOP)
(TOP VIEW)



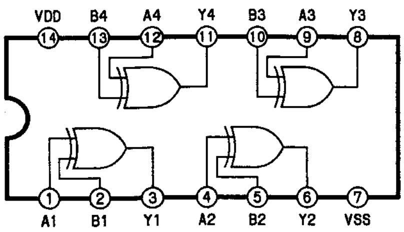
CLK:CLOCK
PR:PRESET
R:RESET
D:DATA

TRUTH TABLE (74HC74)

INPUTS				OUTPUTS	
PR	CLR	CLK	D	Q	$\overline{Q}$
L	H	×	×	H	L
H	L	×	×	L	H
L	L	×	×	H*	H*
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	×	Q0	$\overline{Q0}$

*:UNSTABLE

7486
(QUAD EXCLUSIVE OR GATE)
(TOP VIEW)



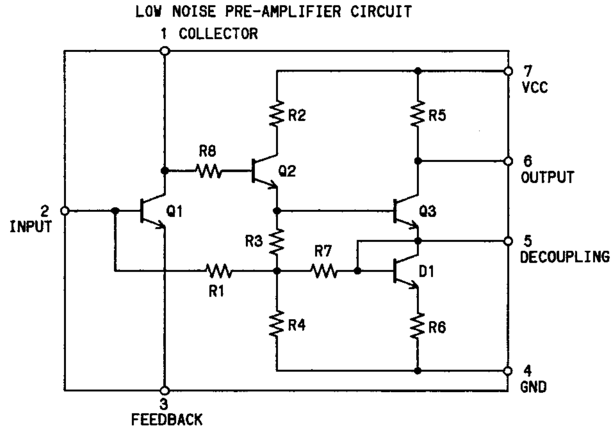
$$Y = A \oplus B = \overline{A}B + A\overline{B}$$

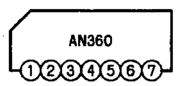
TRUTH TABLE

INPUTS		OUTPUTS
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

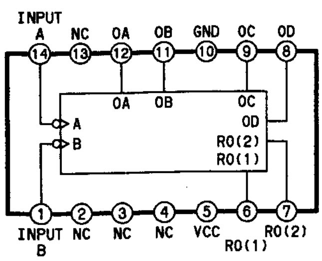
AN360
(PRE-AMPLIFIER)

LOW NOISE PRE-AMPLIFIER CIRCUIT





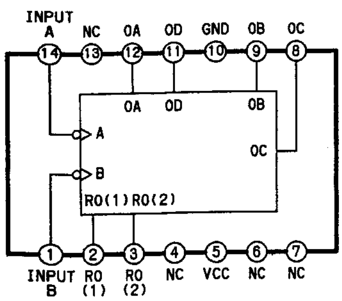
7492
(DIVIDE BY TWELVE COUNTER)



FUNCTION TABLE

INPUT				OUTPUT				FUNCTION
RO	CK A	CK B	PULS	QA	QB	QC	QD	
L	⊓⊔	⊓⊔	0	L	L	L	L	COUNT
			1	H	H	L	L	
			2	L	L	H	L	
			3		L	L	H	
			4		H	L	H	
			5		L	H	H	
			6		L	L	L	
H	×	×	—	L	L	L	L	CLEAR

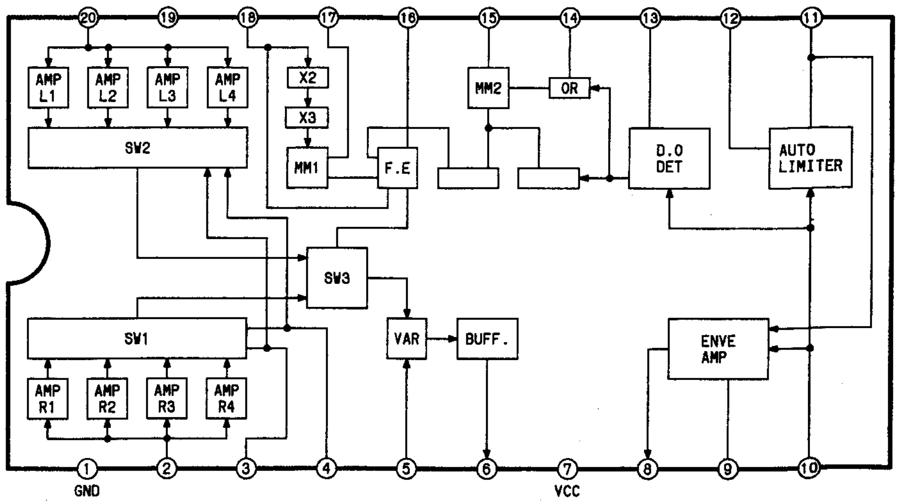
7493
(4-BIT BINARY COUNTER)



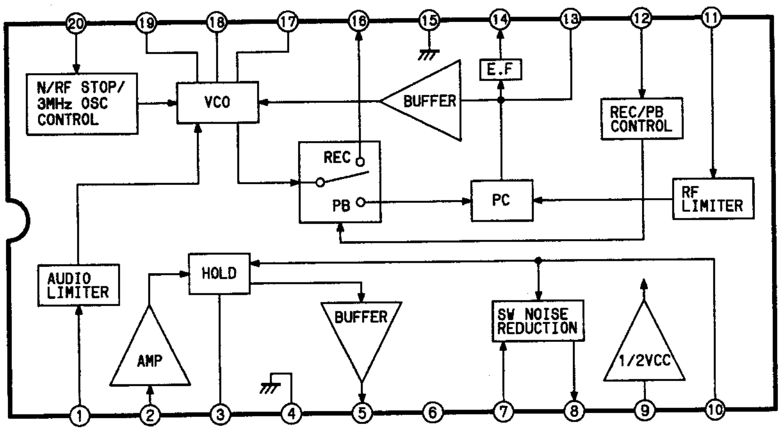
TRUTH TABLE (74HC93)

RESET INPUTS		OUTPUTS			
RO(1)	RO(2)	QD	QC	QB	QA
H	H	L	L	L	L
L	X	COUNT			
X	L	COUNT			

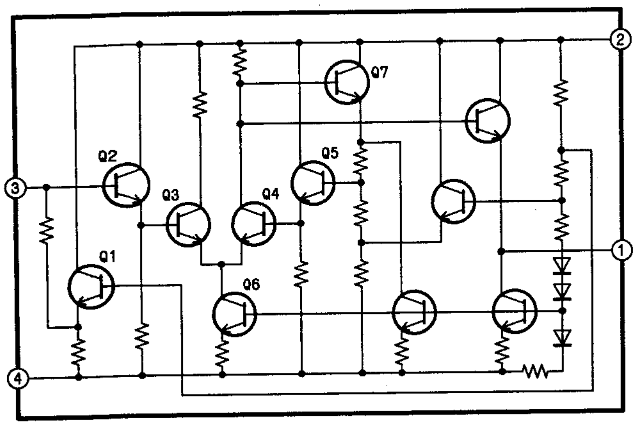
AN3920
(FM AUDIO RF AMPLIFIER)



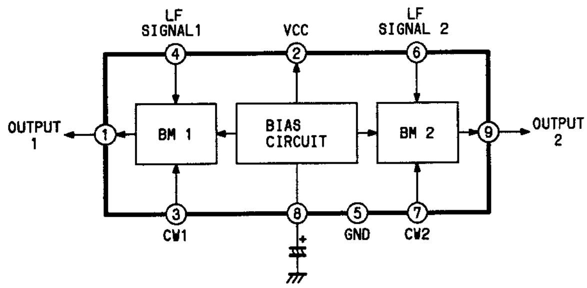
AN3922
(FM MODULATOR/FM DEMODULATOR)



AN608
(WIDE BAND AMPLIFIER)

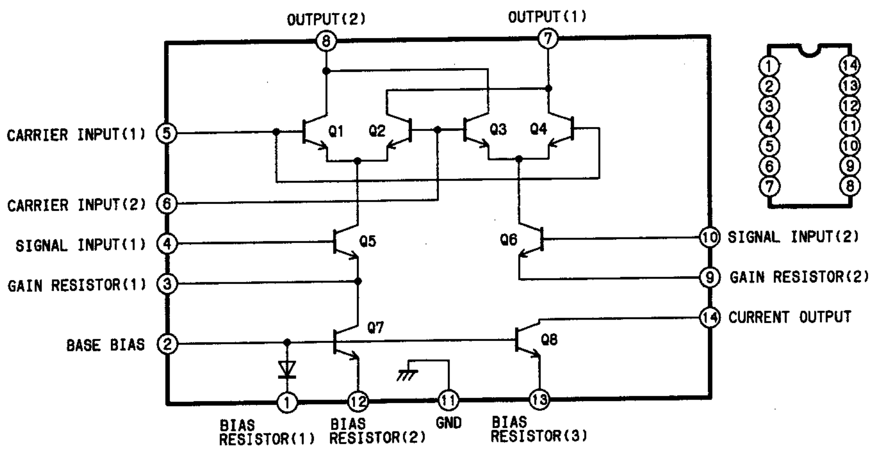


AN6041
(DUAL BALANCED MODULATOR FOR VIDEO CAMERAS)

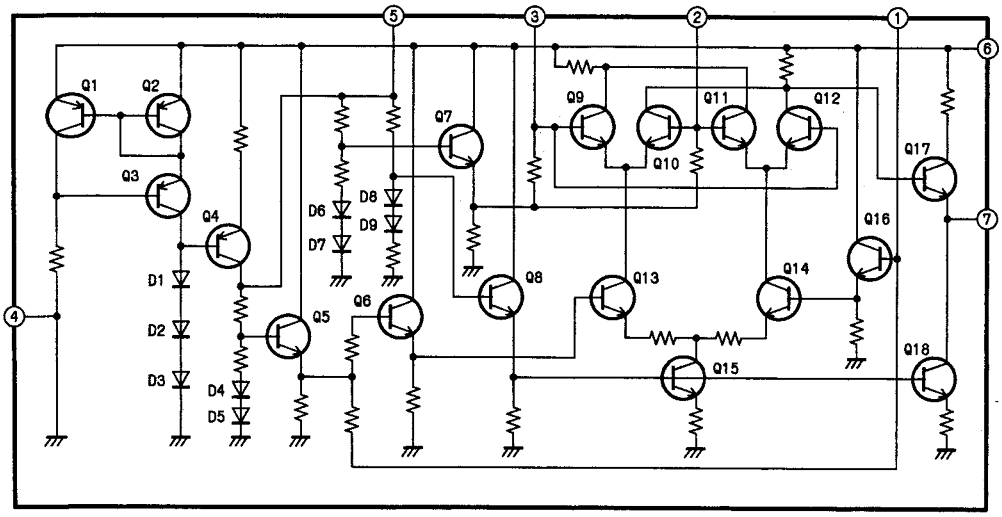


AN610
(BALANCED MODULATOR/DEMODULATOR)

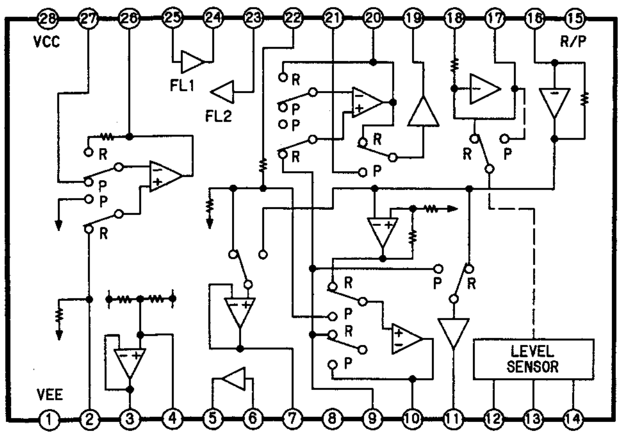
BALANCE MODULATOR CIRCUIT



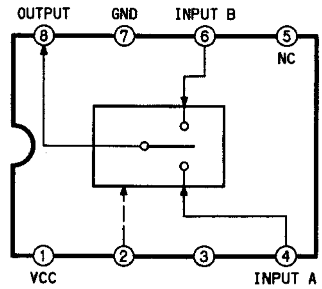
AN612
(BALANCED MODULATOR/DEMODULATOR)



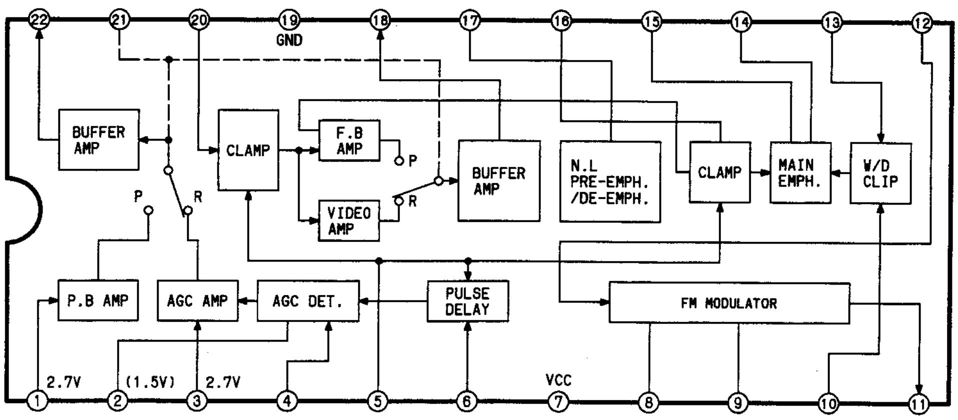
AN6298
(FM AUDIO NOISE REDUCTION)



AN6308
(ANAROG SWITCH)

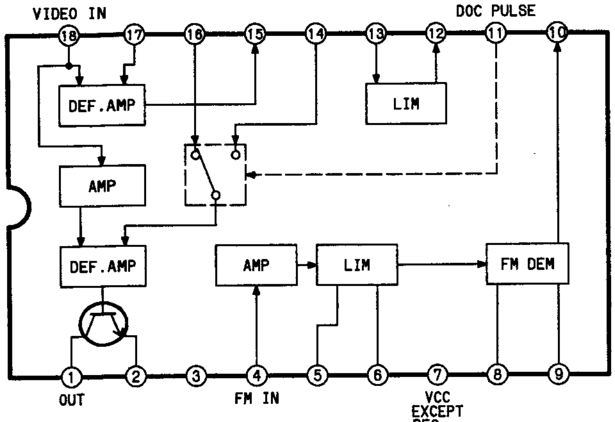


AN6306
(VTR RECORDING VIDEO SIGNAL PROCESSING CIRCUIT)



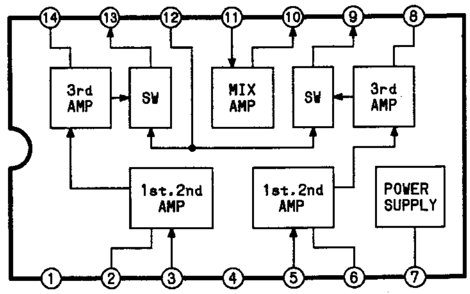
AN6328

(VTR LINE NOISE CANCELLER CIRCUIT)



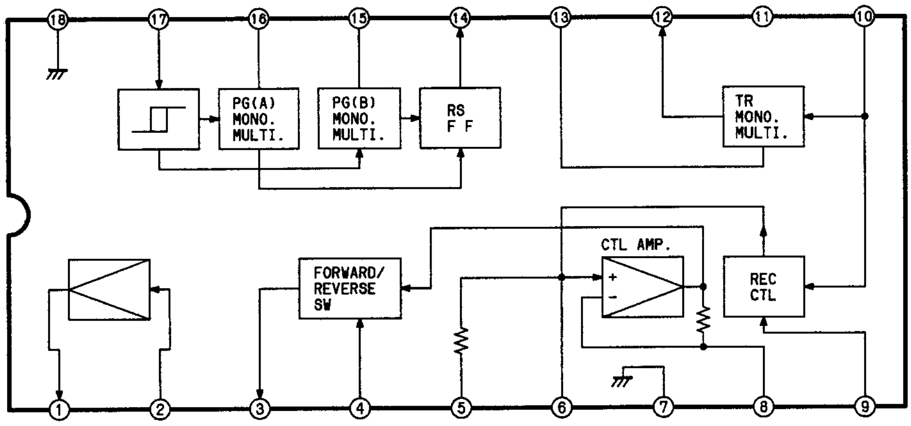
AN6330

(HEAD AMPLIFIER FOR VTR)

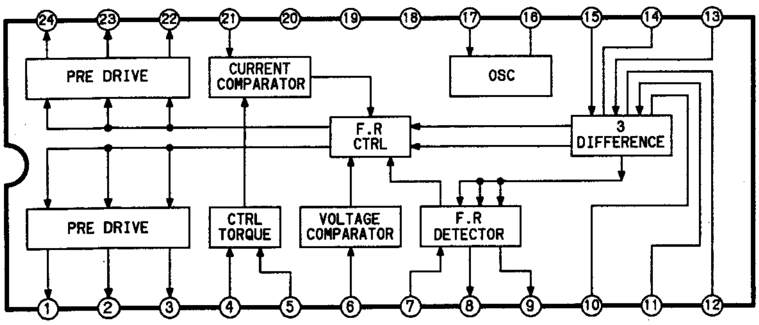


AN6346

(VTR CYLINDER INTERFACE CIRCUIT)

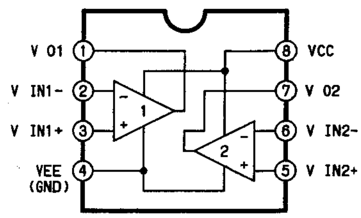


AN640G



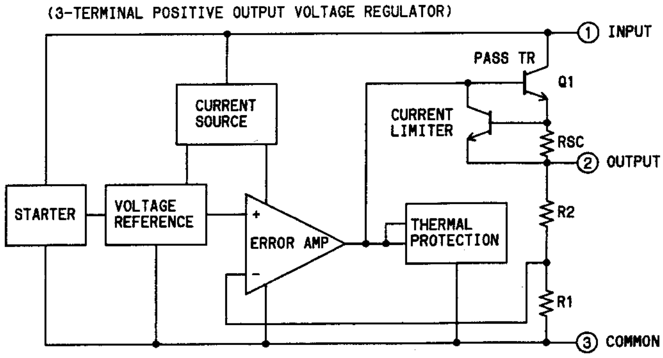
AN6558

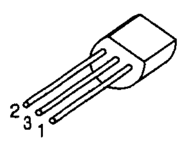
(LOW NOISE.HIGH SLEW RATE OPERATIONAL AMPLIFIER)



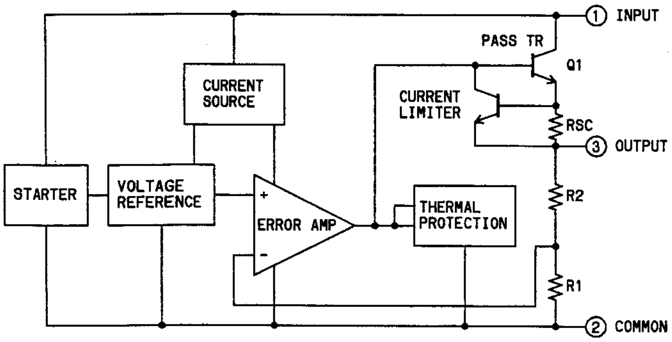
AN78L00

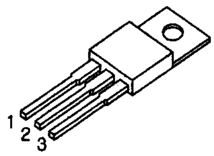
(3-TERMINAL POSITIVE OUTPUT VOLTAGE REGULATOR)



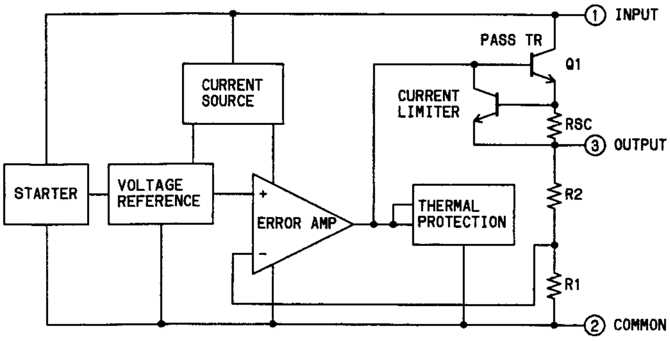


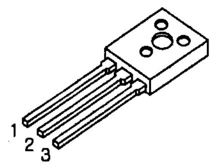
AN78M00
(3-TERMINAL POSITIVE OUTPUT VOLTAGE REGULATOR)



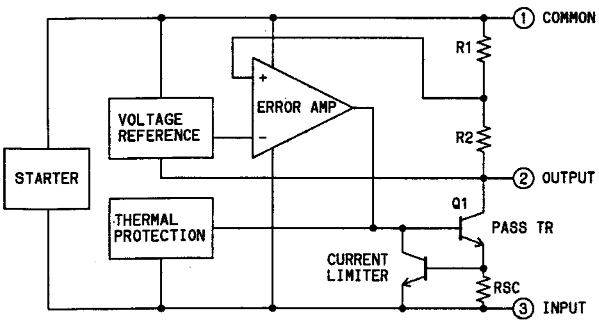


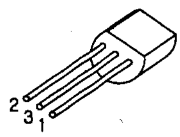
AN78N00
(3-TERMINAL POSITIVE OUTPUT VOLTAGE REGULATOR)



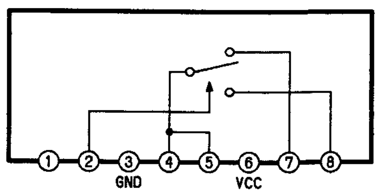


AN79L00
(3-TERMINAL NEGATIVE OUTPUT VOLTAGE REGULATOR)

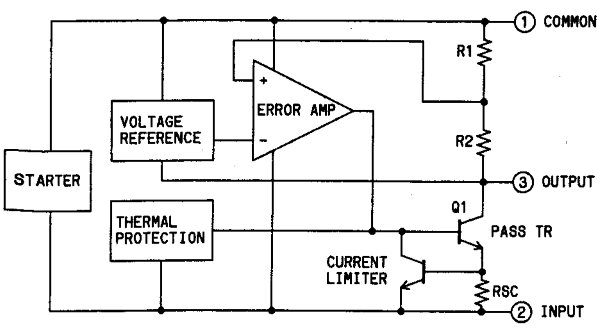


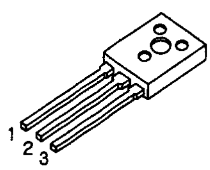


BA7001
(SWITCHER FOR VTR)

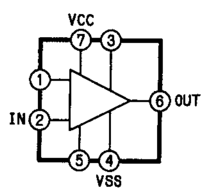


AN79N00
(3-TERMINAL NEGATIVE OUTPUT VOLTAGE REGULATOR)

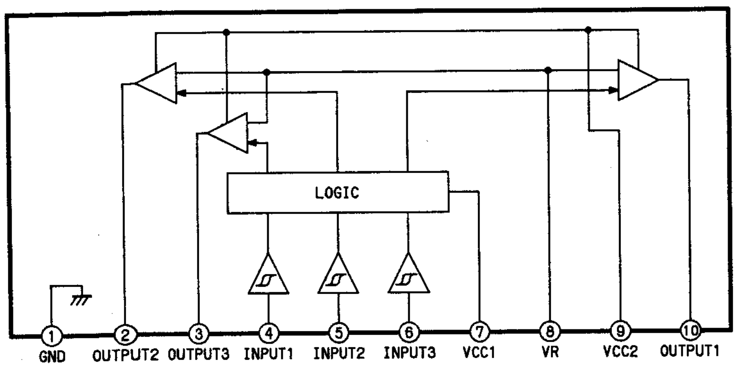




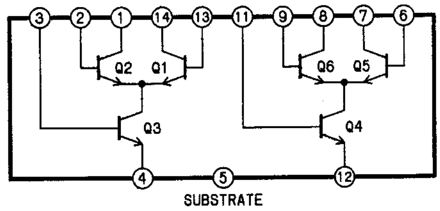
BA301



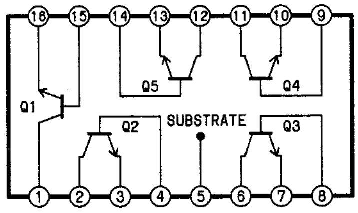
BA6238
(LOADING REGULATOR)



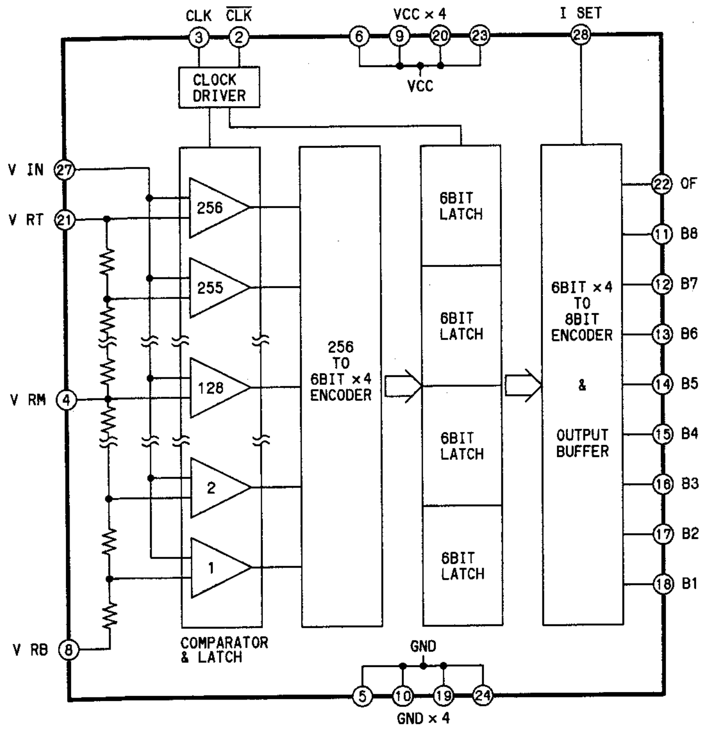
CA3054
(TRANSISTOR ARRAY-DUAL INDEPENDENT DIFFERENTIAL AMPLIFIER)



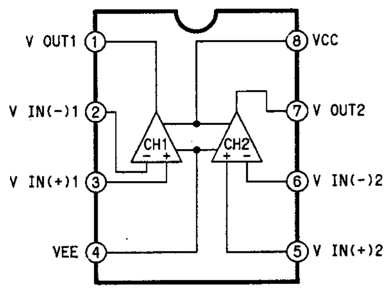
CA3127
(HIGH FREQUENCY N-P-N TRANSISTOR ARRAY)



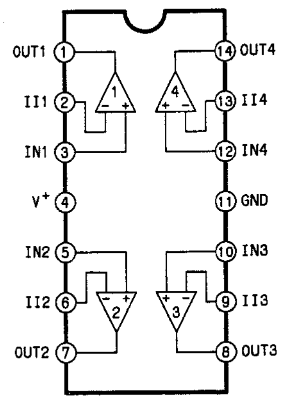
HA19211P
(8-BIT PARALLEL TYPE A/D CONVERTER)



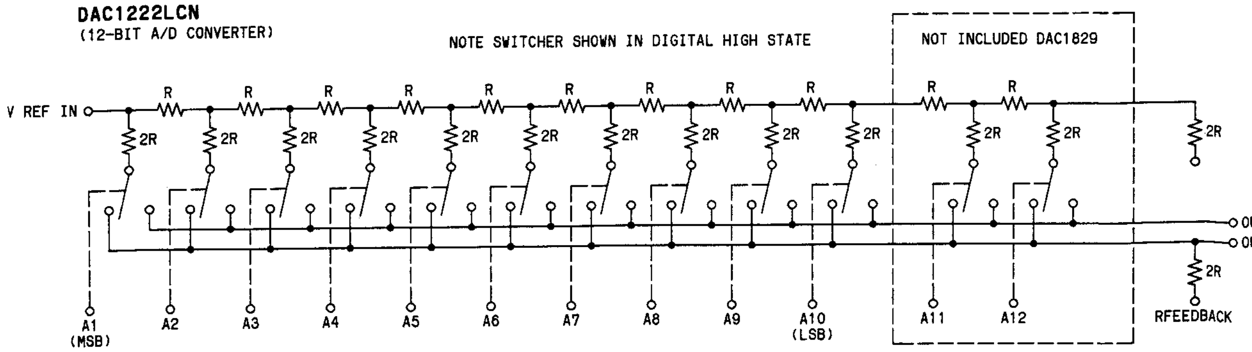
HA17082
(J-FET TOP DUAL OPERATIONAL AMPLIFIER)
(TOP VIEW)



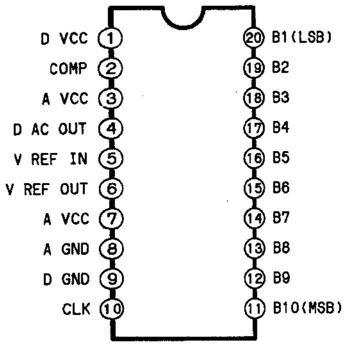
HA17084
(J-FET TOP DUAL OPERATIONAL AMPLIFIER)
(TOP VIEW)



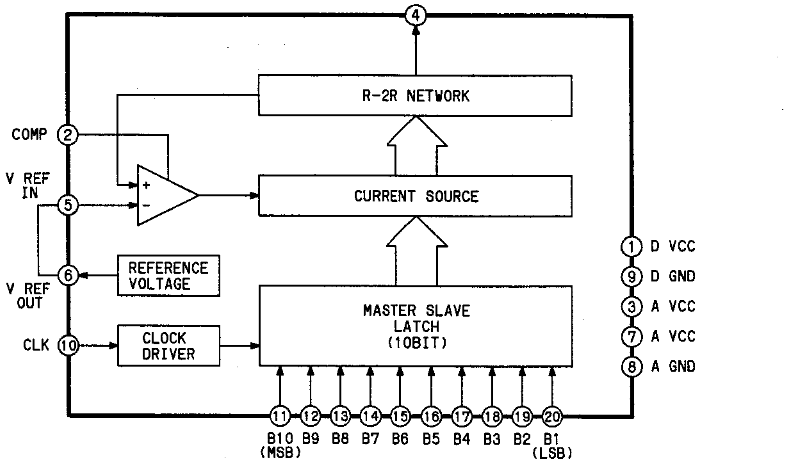
DAC1222LCN
(12-BIT A/D CONVERTER)



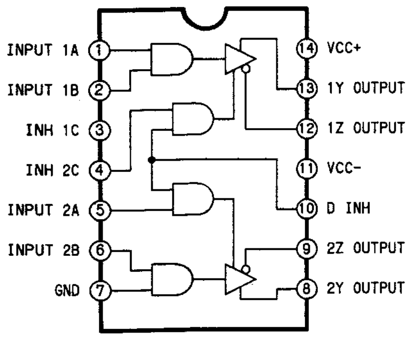
HA19505
(10-BIT D/A CONVERTER)



(TOP VIEW)

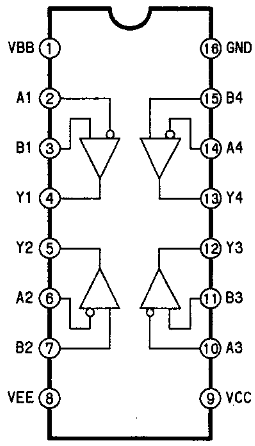


HD75110
(DUAL DIFF LINE DRIVER)

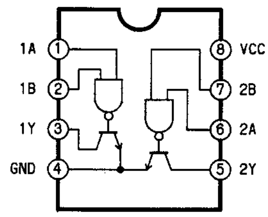


LOGIC INPUTS		INHIBITOR INPUTS		OUTPUTS	
A	B	C	D	Y	G
X	X	L	X	OFF	OFF
X	X	X	L	OFF	OFF
L	X	H	H	ON	OFF
X	L	H	H	ON	OFF
H	H	H	H	OFF	ON

HD10125
(QUADRUPLE ECL TO TTL TRANSLATORS)
(TOP VIEW)

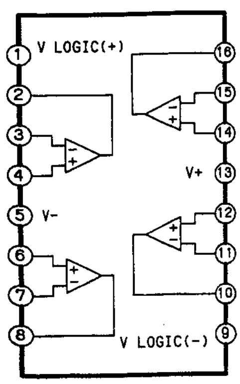


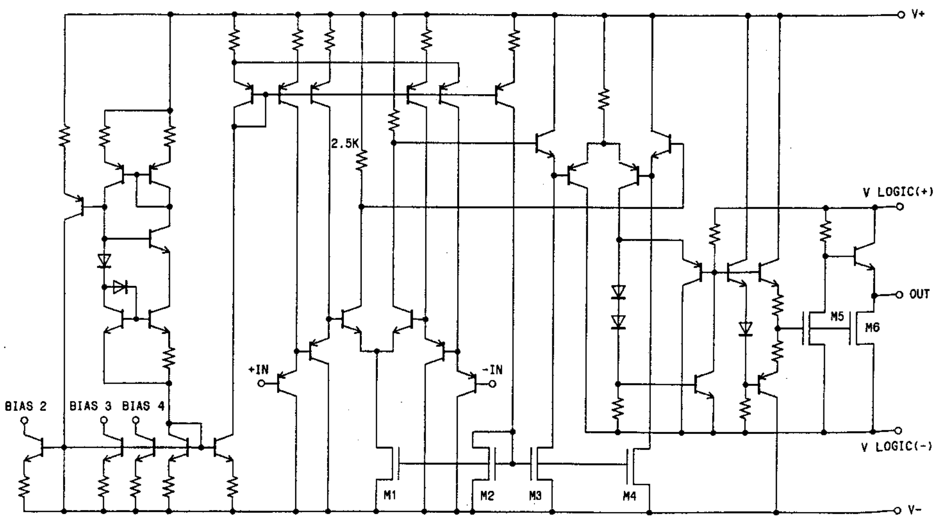
HD75451AP
(DUAL PERIPHERAL AND DRIVER)



HA4905-5
(PRECISION QUAD COMPARATOR)

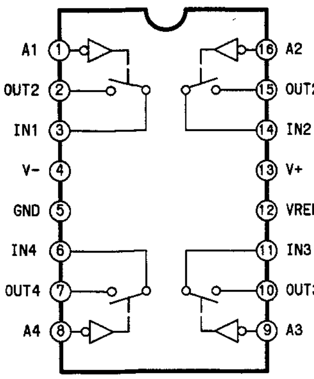
(TOP VIEW)



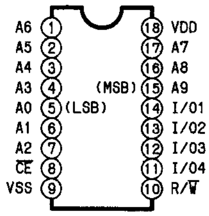


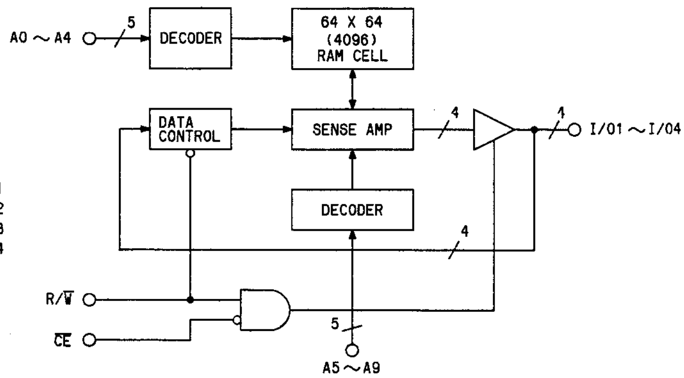
HI-201-5
(DUAL SPST CMOS ANALOG SWITCH)

(TOP VIEW)

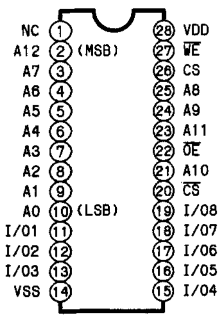


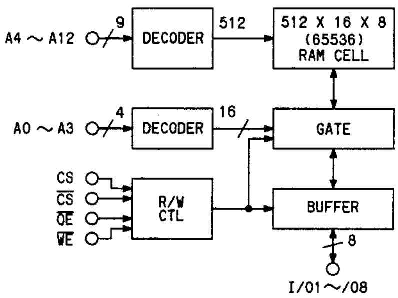
HM6148HP-55
(4K CMOS STATIC RAM)





HM6264LP-12
(64K CMOS STATIC RAM)





FUNCTION TABLE

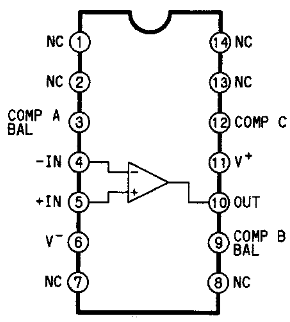
INPUT			I/O		FUNCTION
$\overline{CS}$	$\overline{WE}$	$\overline{OE}$	DI	DO	
H	X	X	X	HIGH-Z	NON SELECT
L	H	L	HIGH-Z	DO	READ
L	L	H	DI	HIGH-Z	WRITE
L	L	L	DI	HIGH-Z	WRITE
L	H	H	X	HIGH-Z	SELECT

CS=H

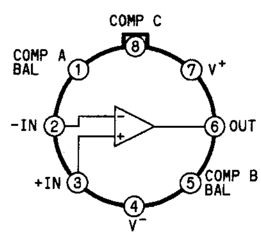
LM318N
(HIGH SPEED OPERATIONAL AMPLIFIER)

(TOP VIEW)

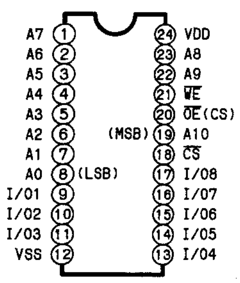
DIP

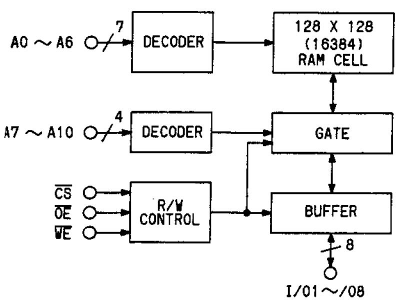


METAL CAN

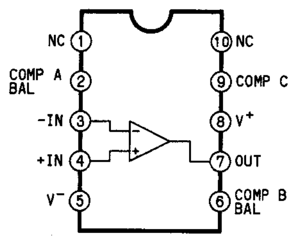


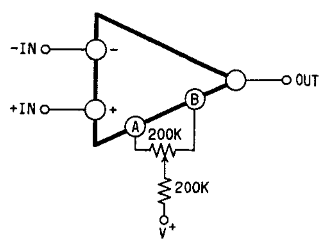
HM6116LFP-2
(16K CMOS STATIC RAM)



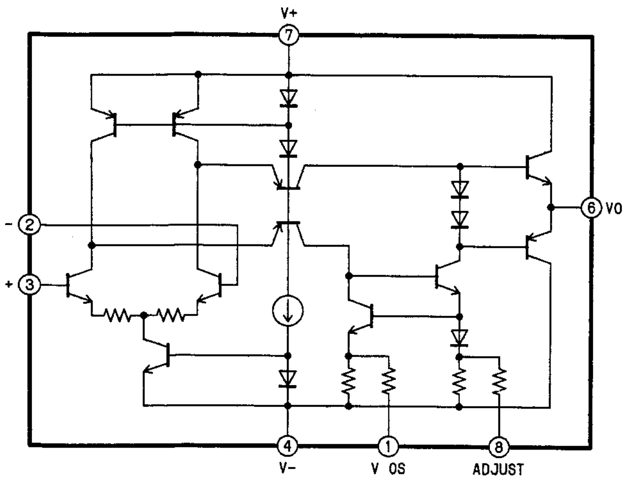


FLAT

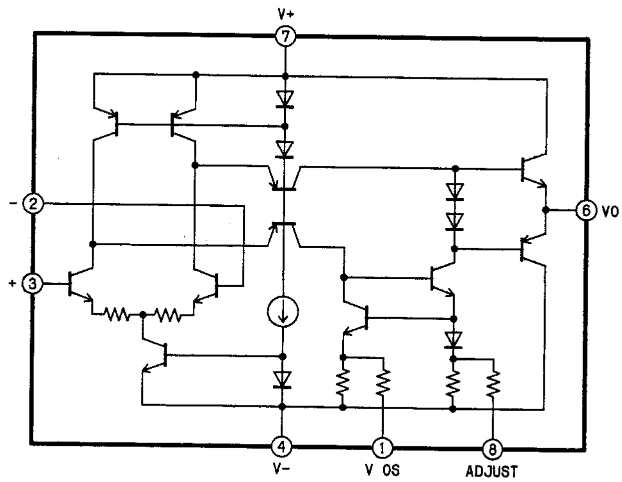




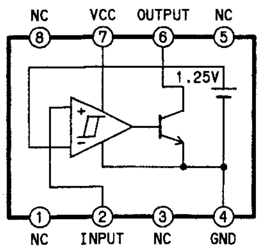
LM6361N
(HIGH SPEED OPERATIONAL AMPLIFIER)



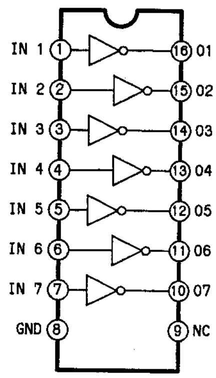
LM6364N
(HIGH SPEED OPERATIONAL AMPLIFIER)



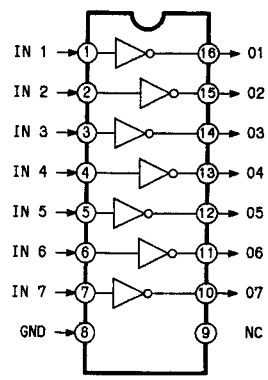
M51946BFP
(VOLTAGE DETECTOR)



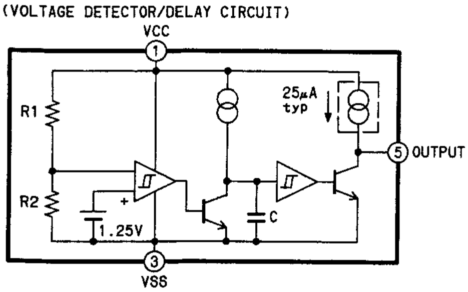
M54514AP
(7-UNIT 50mA TRANSISTOR ARRAY)
(TOP VIEW)



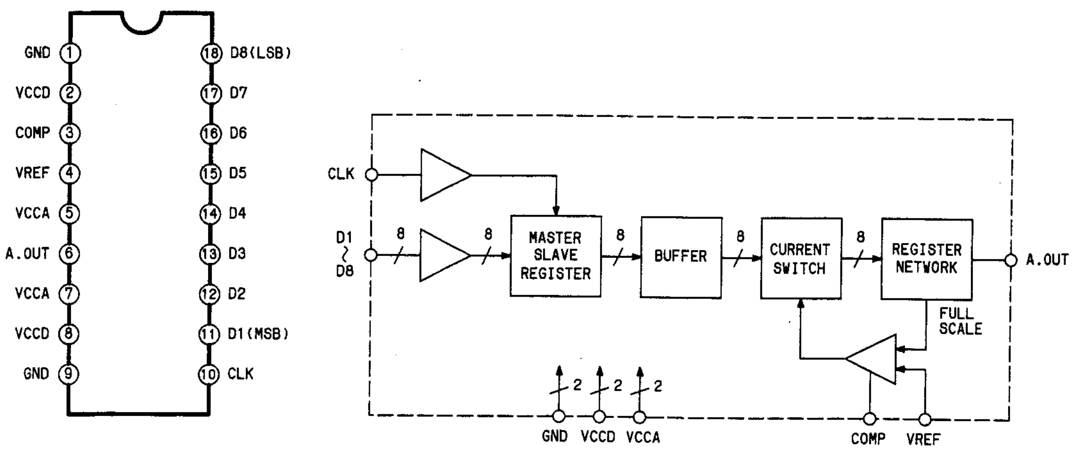
M54517P
(7-UNIT DARLINGTON TRANSISTOR ARRAY)



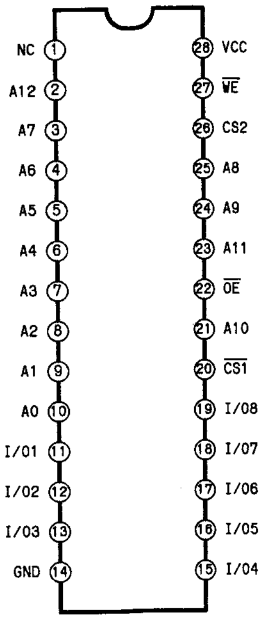
M51951
(VOLTAGE DETECTOR/DELAY CIRCUIT)

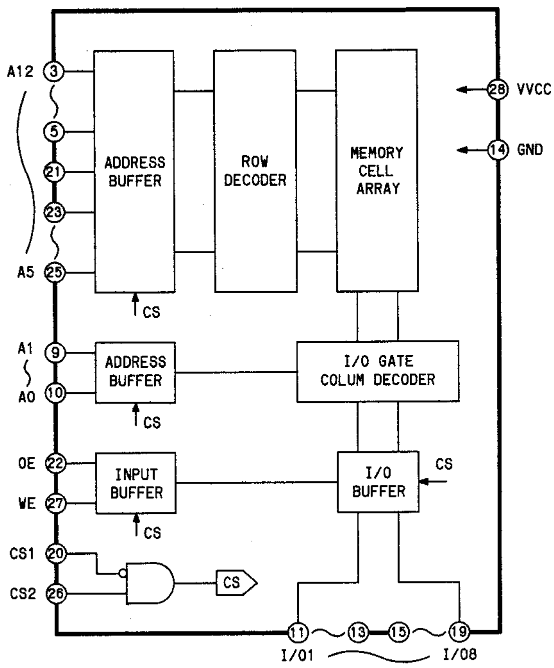


MB40778
(8-BIT VIDEO A/D CONVERTER)

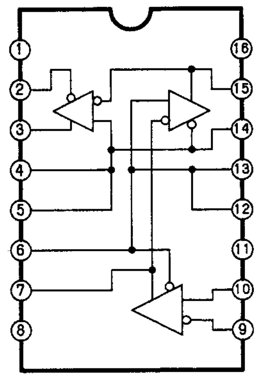


MB8464A80LSK

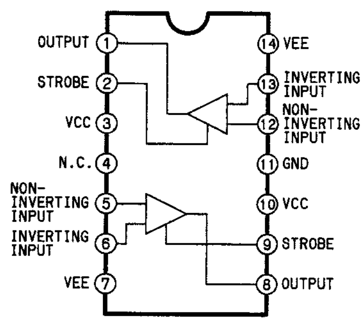




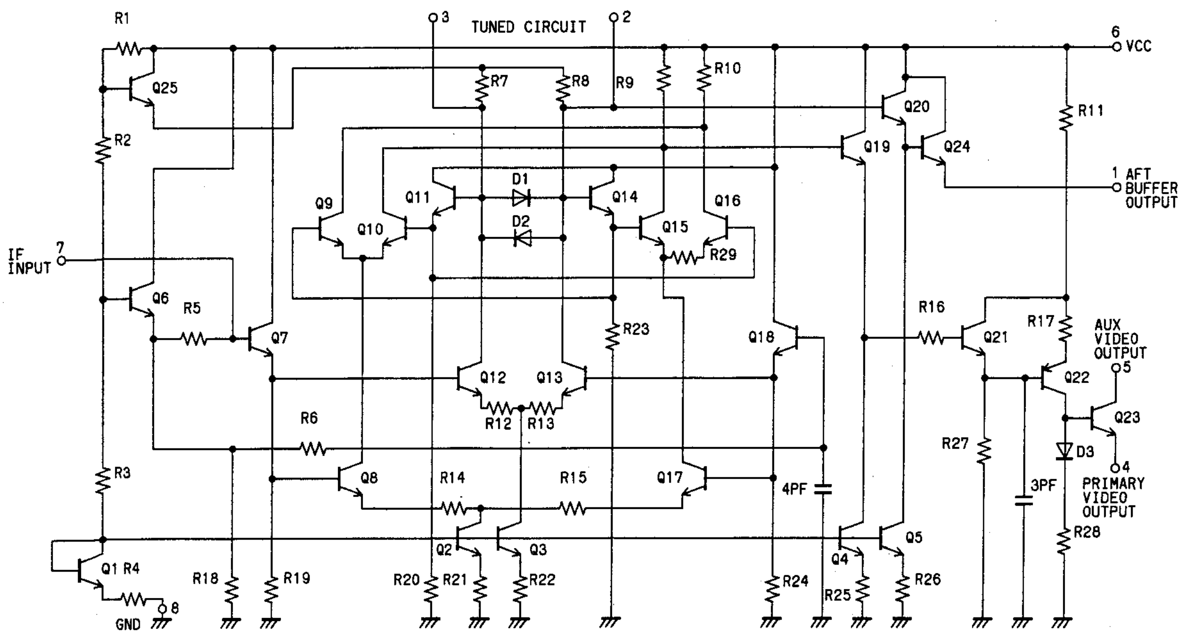
MC10116
(TRIPLE DIFFERENTIAL LINE RECEIVER)
(TOP VIEW)



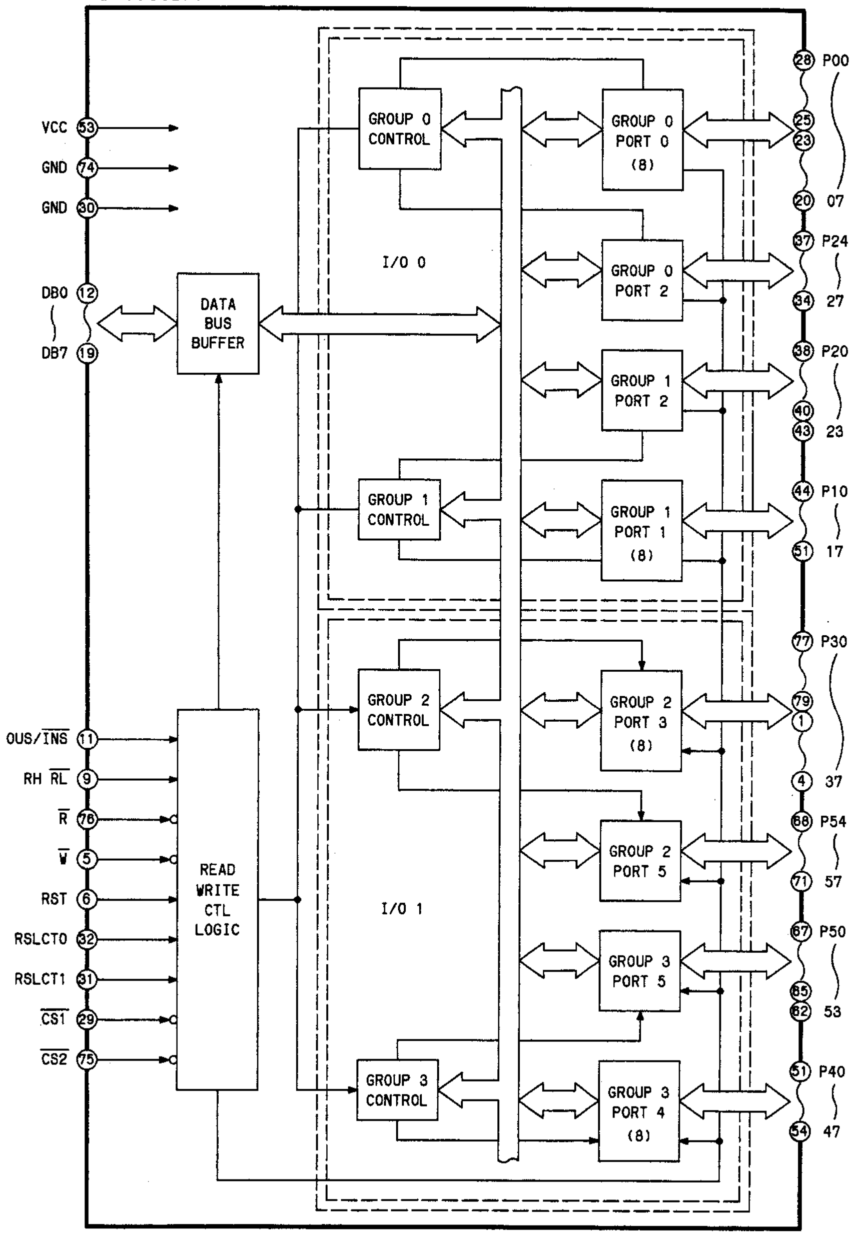
MC1414P
(HIGH SPEED DUAL DIFFERENTIAL COMPARATOR)
(TOP VIEW)



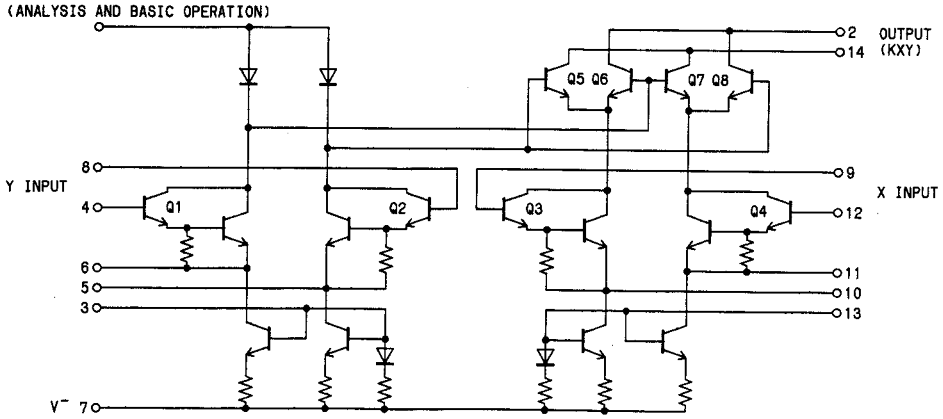
MC1330A1P
(TV VIDEO IF AMPLIFIER)



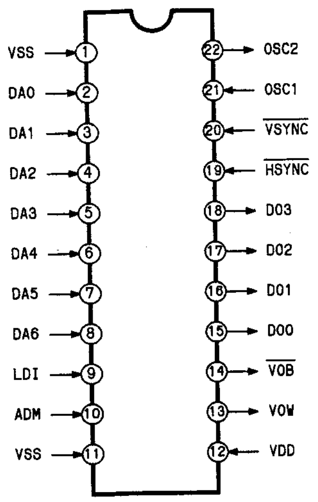
MB89363BPF

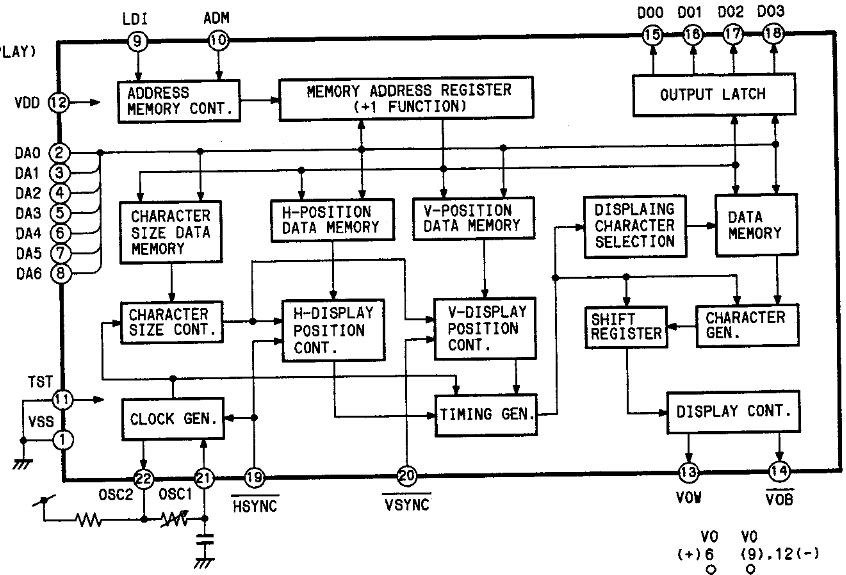


MC1495L
(ANALYSIS AND BASIC OPERATION)

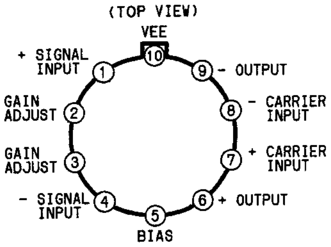


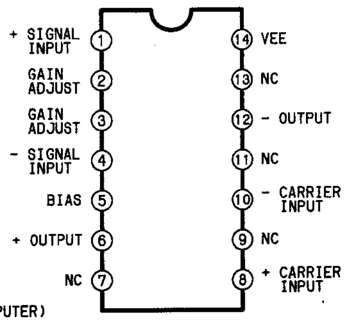
MN1227
(CRT CONTROL LSI FOR 60-CHARACTER DISPLAY)

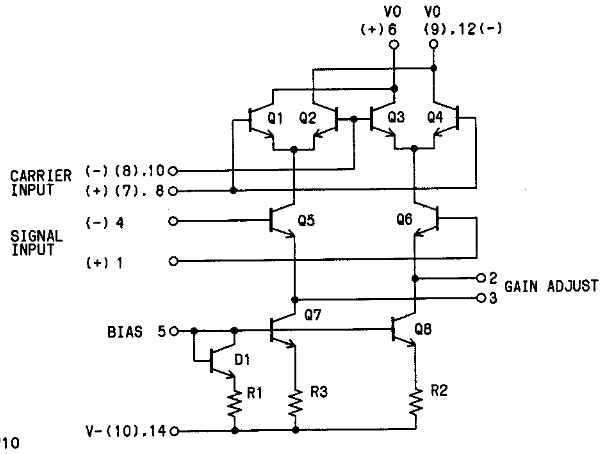




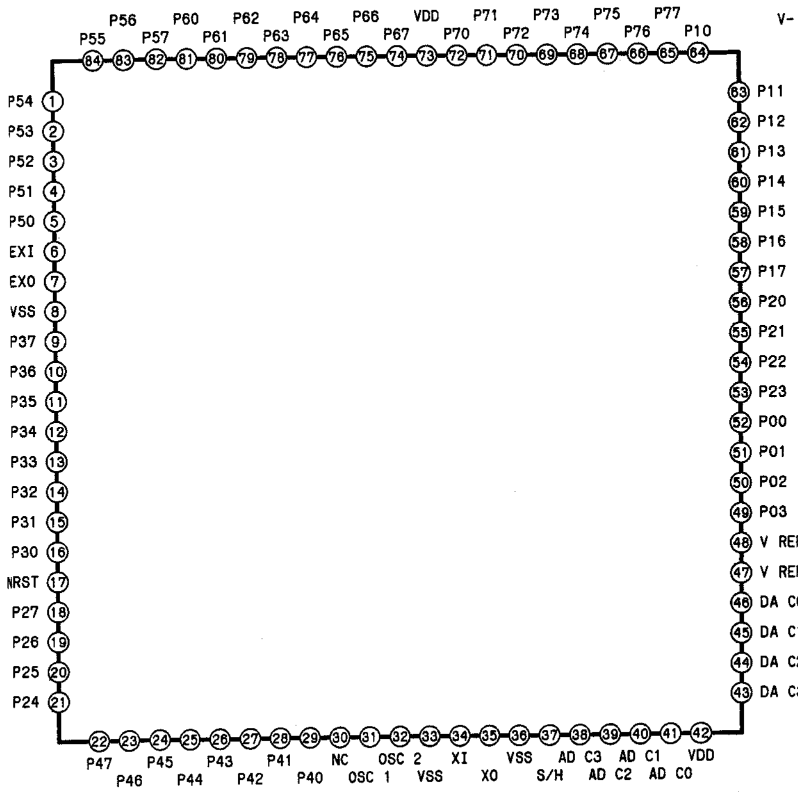
MC1496
(BALANCED MODULATOR)



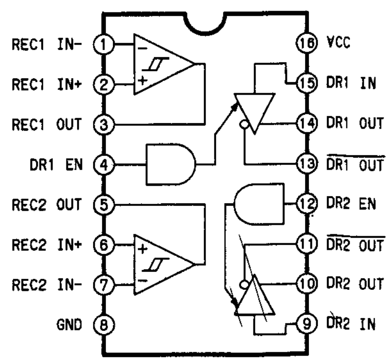




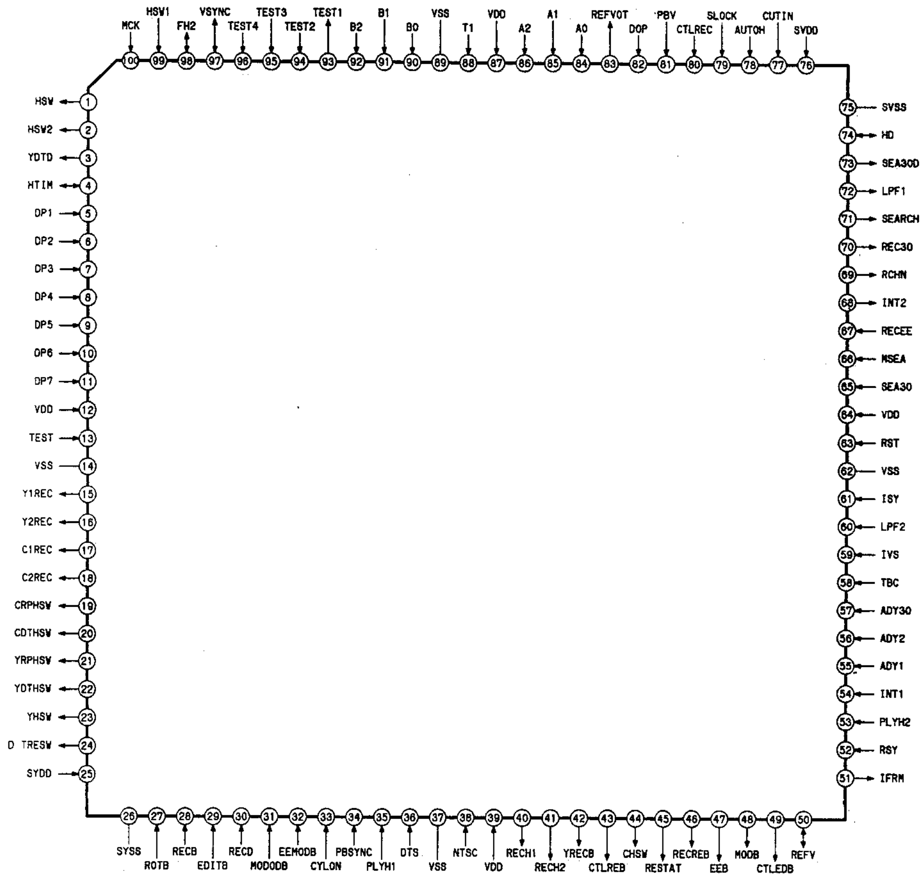
MN18882
(GENERAL PURPOSE 8-BIT MICRO COMPUTER)



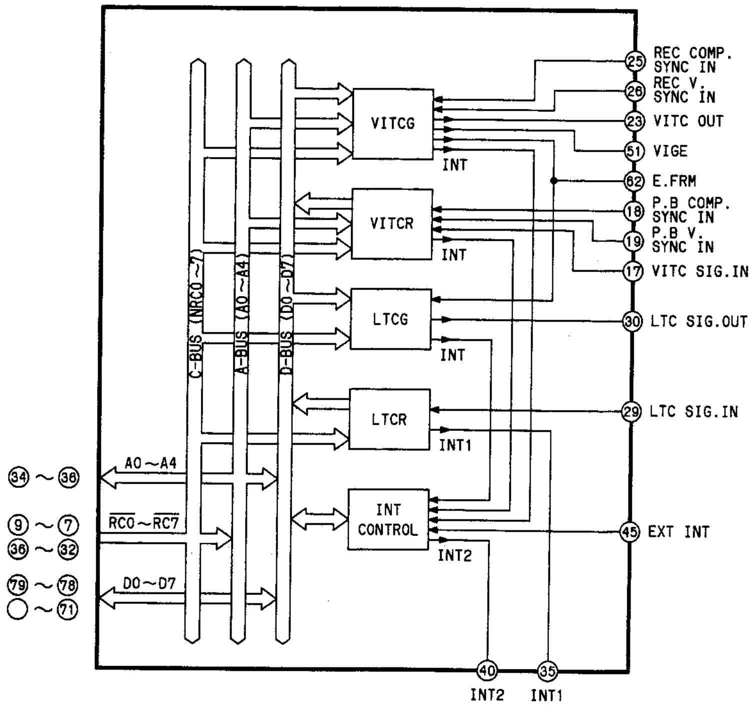
MC34051
(DUAL RS-422/423 TRANSCEIVER)



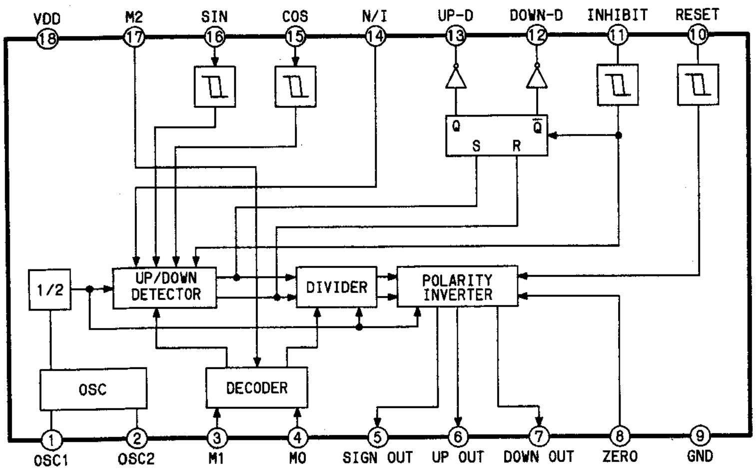
MN51030
(3000 GATES CMOS GATE ARRAY)



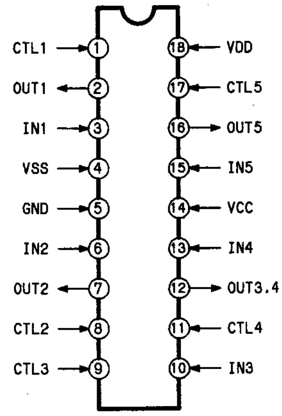
MN51040
(TIME CODE GENERATOR/READER)

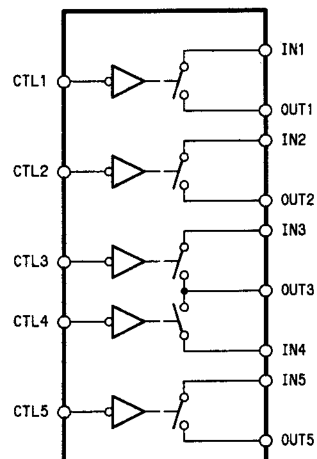


MSM5210RS



MN6631
(5-CHANNEL CMOS ELECTRONIC SWITCH)
(TOP VIEW)

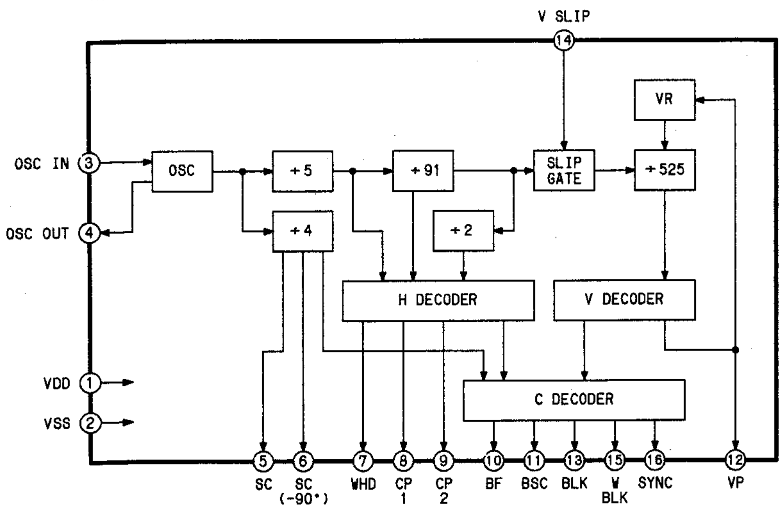




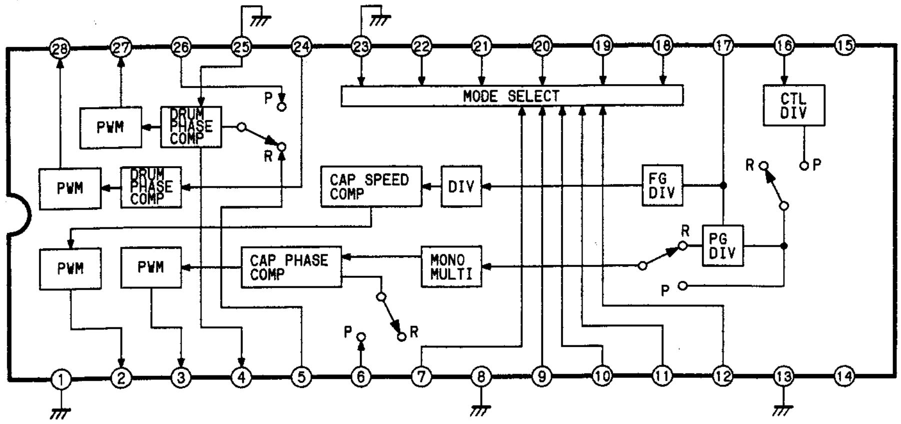
FUNCTION TABLE

INPUT	SWITCH
L	ON
H	OFF

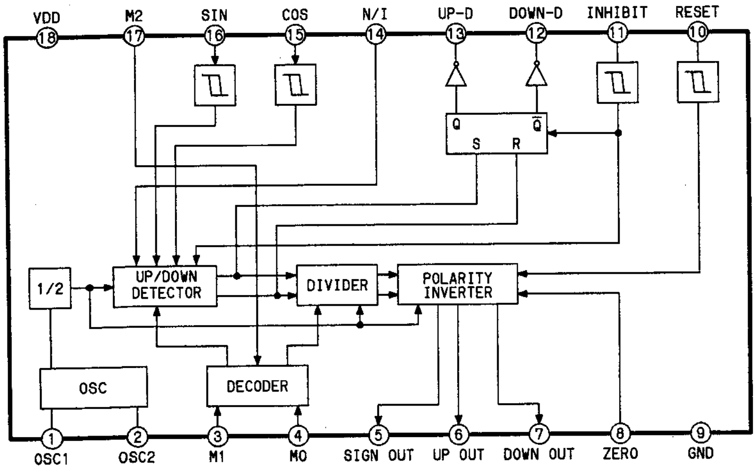
MN6064R
(NTSC VIDEO SIGNAL GENERATOR)



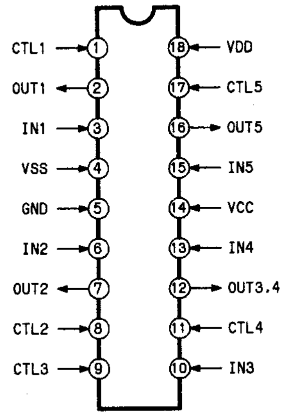
MN6168VIA
(DIGITAL SERVO LSI FOR VIDEO TAPE RECORDERS)

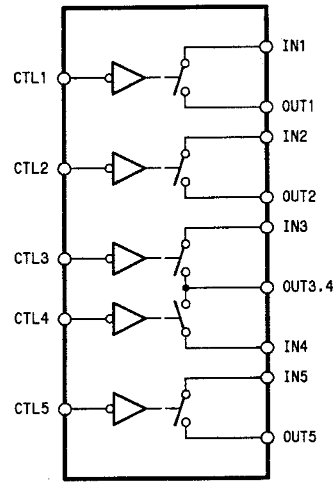


MSM5210RS



MN6631
(5-CHANNEL CMOS ELECTRONIC SWITCH)
(TOP VIEW)

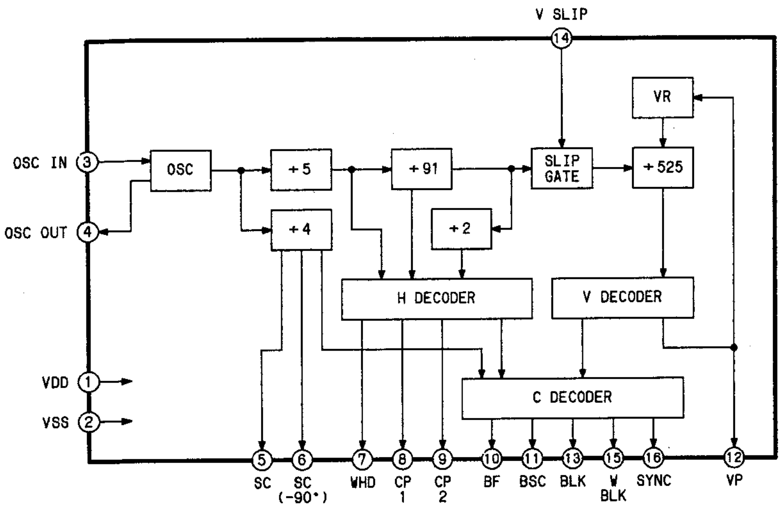




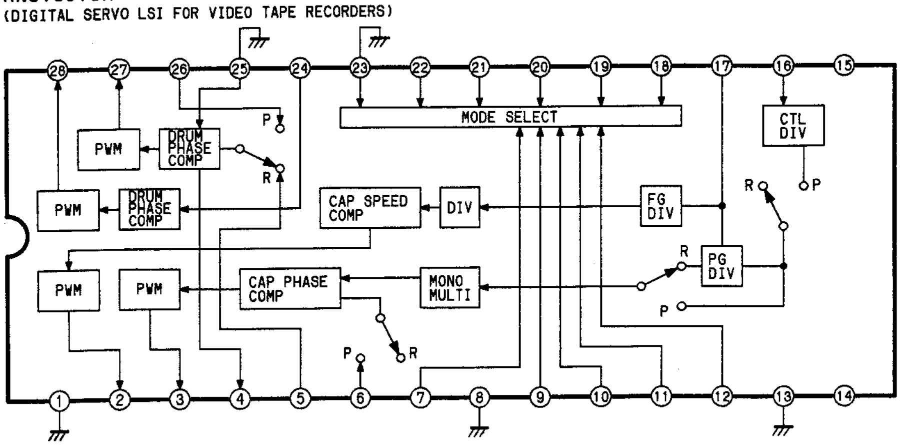
FUNCTION TABLE

INPUT	SWITCH
L	ON
H	OFF

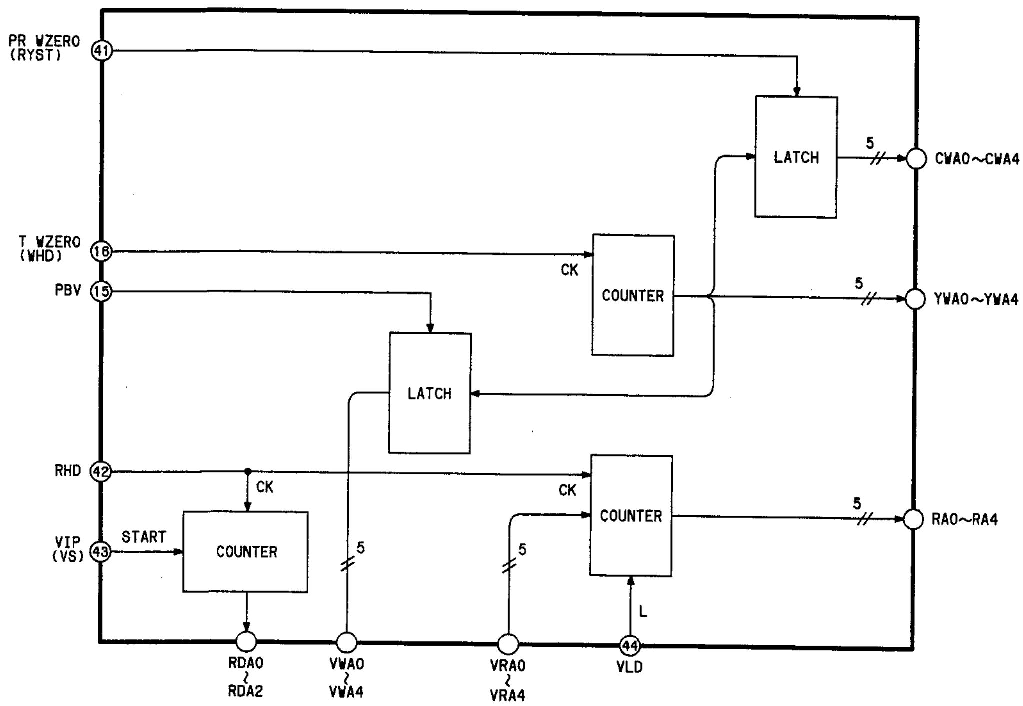
MN6064R
(NTSC VIDEO SIGNAL GENERATOR)



MN6168VIA
(DIGITAL SERVO LSI FOR VIDEO TAPE RECORDERS)



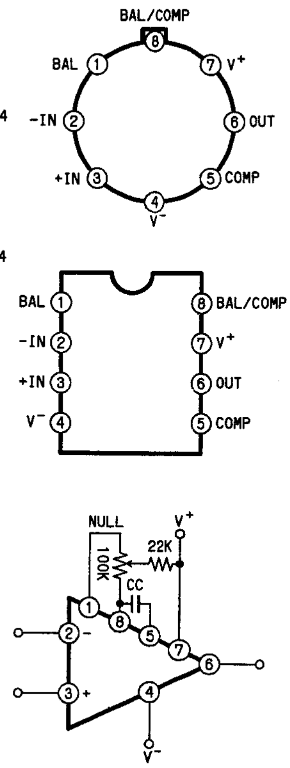
MSM71056



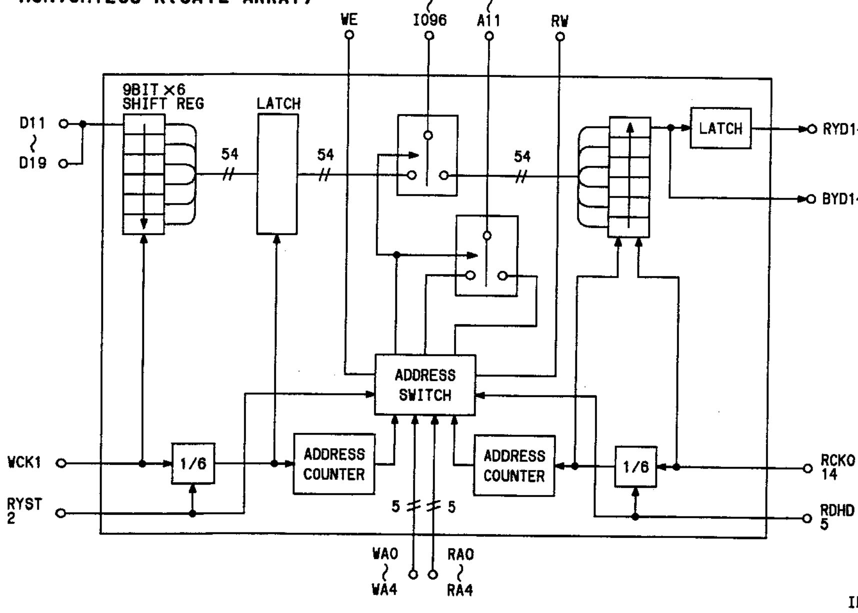
NE5534D

(SINGLE AND DUAL LOW NOISE OPERATIONAL AMPLIFIER)

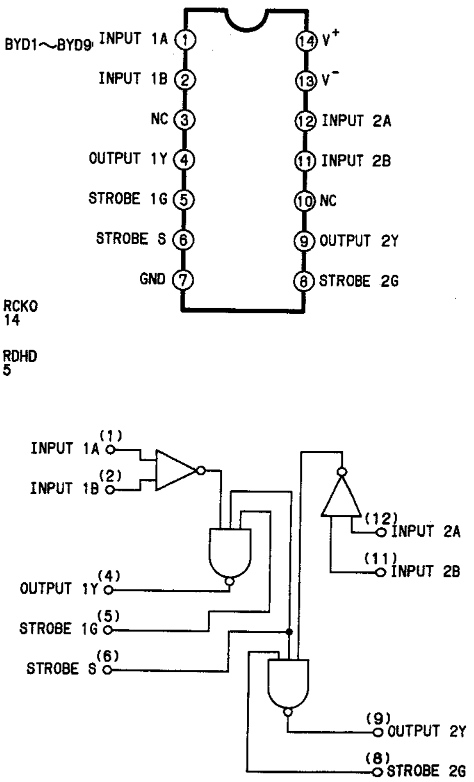
(TOP VIEW)



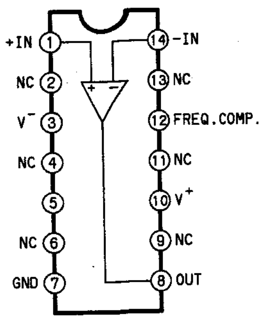
MSM76H12GS-K(GATE ARRAY)



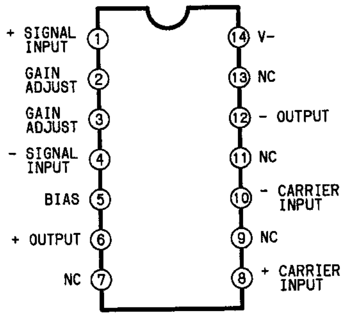
NE521 (HIGH SPEED DUAL DIFFERENTIAL COMPARATOR)

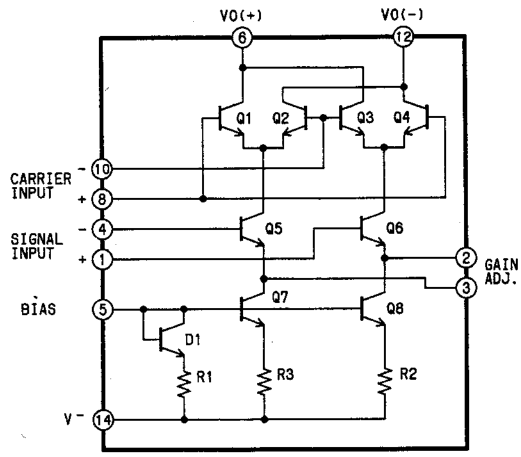


NE5539
(ULTRA HIGH FREQUENCY OPERATIONAL AMPLIFIER)
(TOP VIEW)

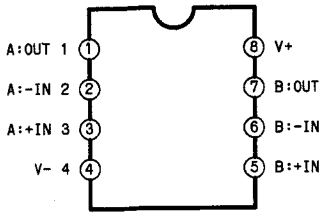


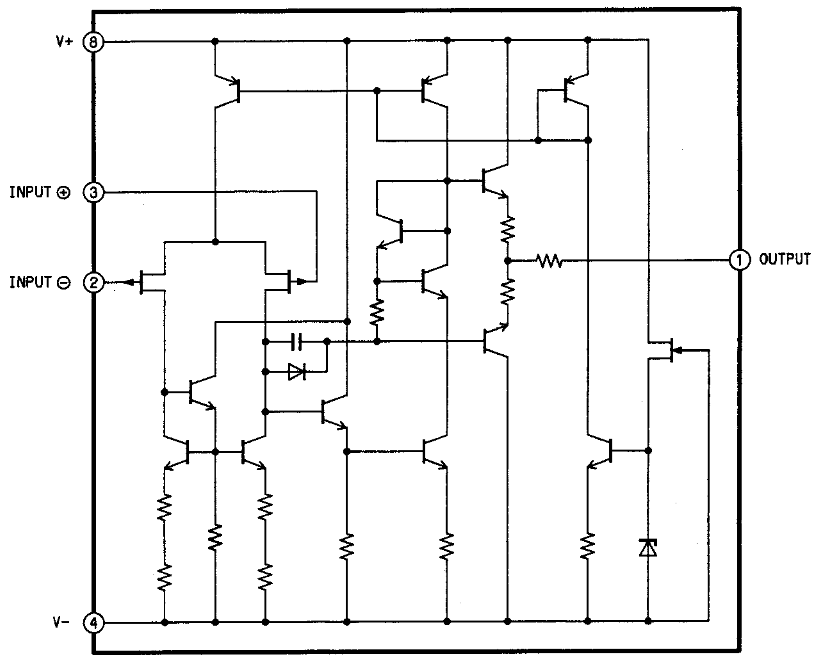
NJM1496
(BALANCED MODULATOR/DEMODULATOR)



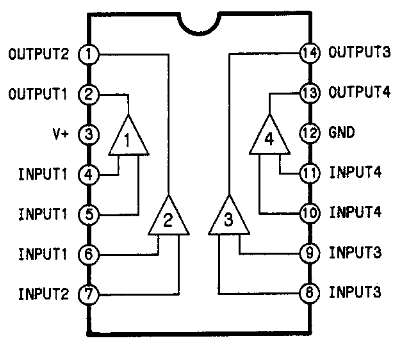


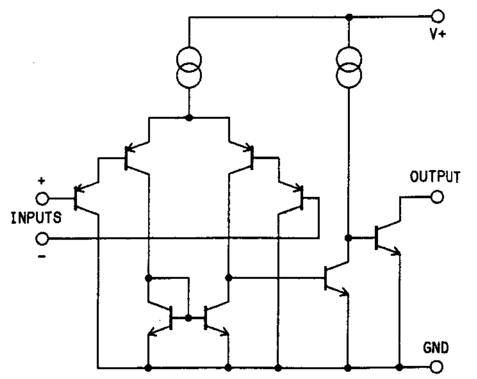
NJM082BM
(OPERATIONAL AMPLIFIER)



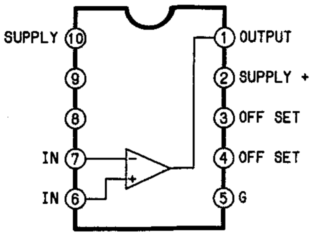


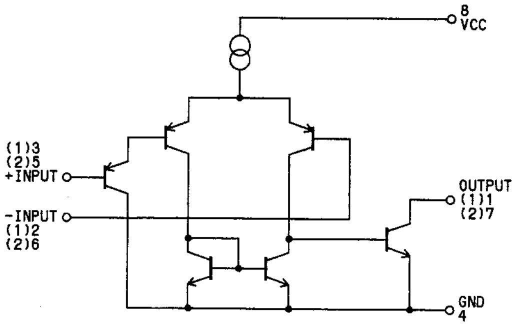
NJM2901
(QUAD VOLTAGE COMPARATOR)
(TOP VIEW)



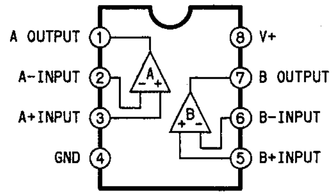


NJM2903
(VOLTAGE CONPARATOR)
(TOP VIEW)

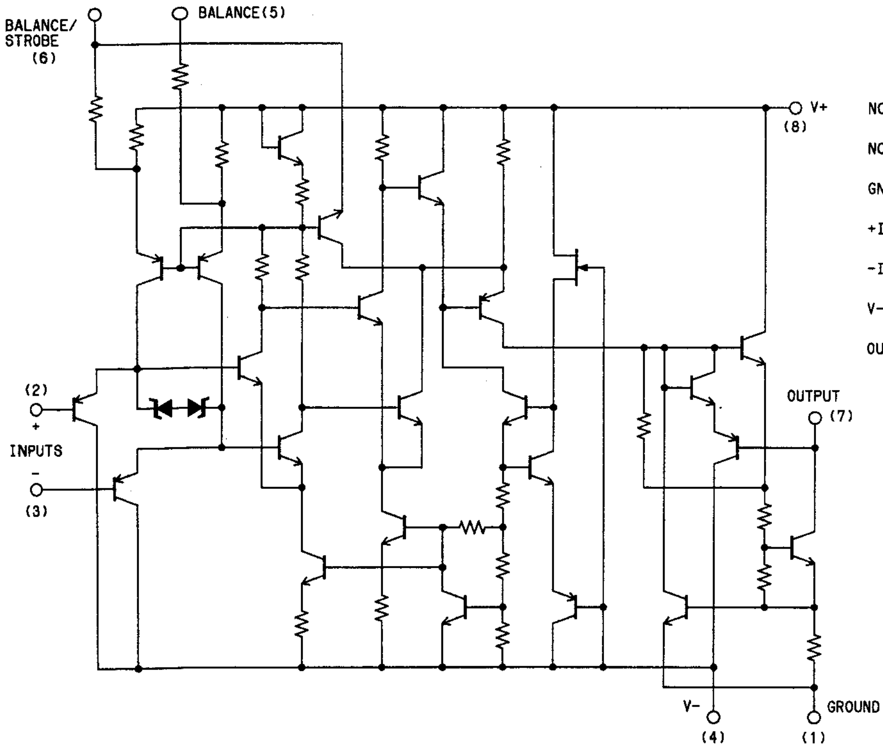




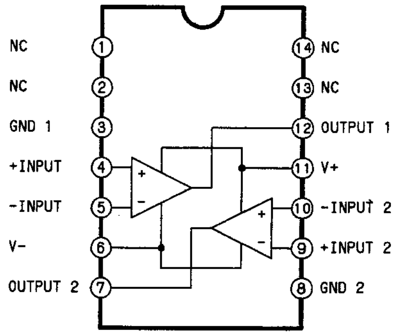
NJM2904
(DUAL SIGNAL SUPPLY OPERATIONAL AMPLIFIER)
(TOP VIEW)



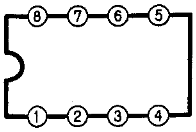
NJM311
(VOLTAGE COMPARATOR)

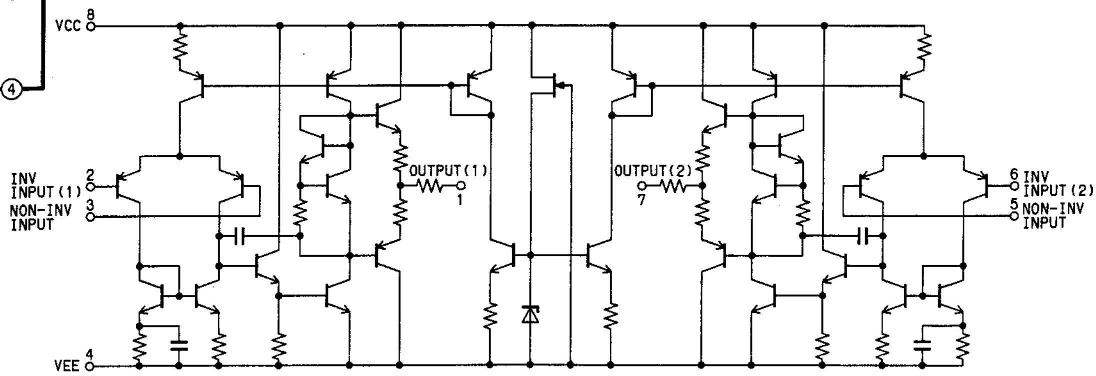


NJM319
(DUAL VOLTAGE COMPARATOR)
(TOP VIEW)

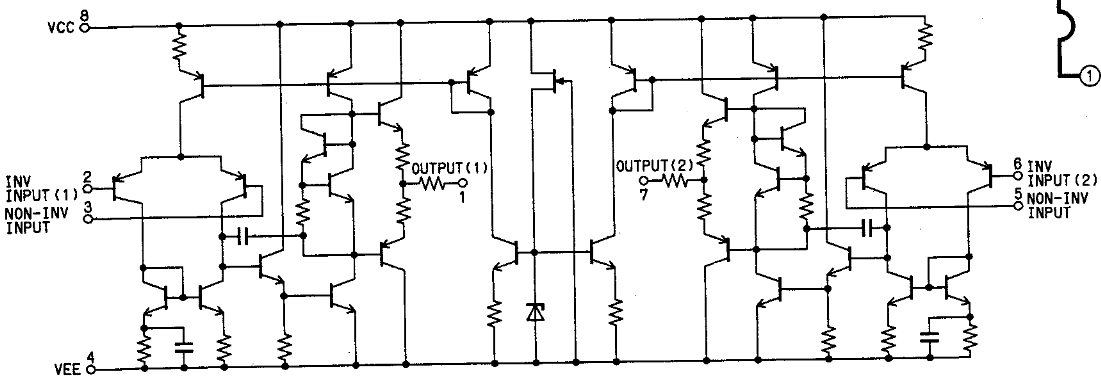


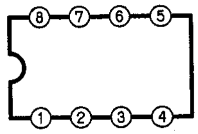
NJM4556
(OPERATIONAL AMPLIFIER)



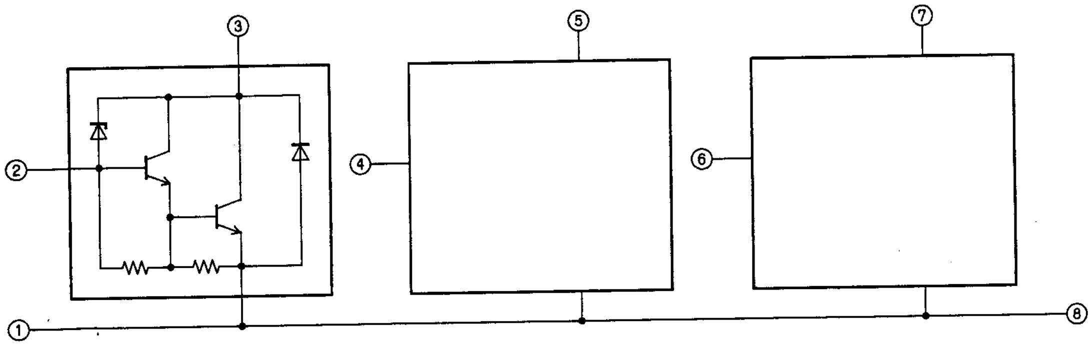


NJM4560
(OPERATIONAL AMPLIFIER)

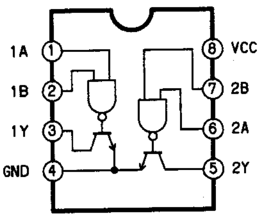




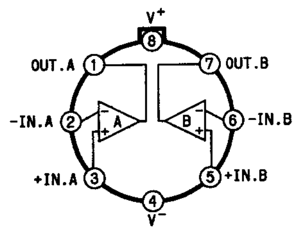
STA301A
(DARLINGTON TRANSISTOR ARRAY)

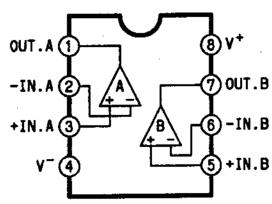


SN75452BP/N
(DUAL PERIPHERAL NAND DRIVER)

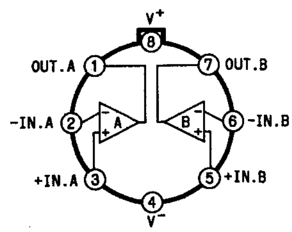


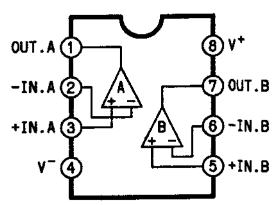
TL072
(LOW NOISE BI-FET OPERATIONAL AMPLIFIER)
(TOP VIEW)



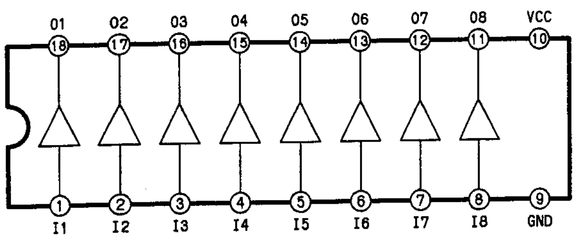


TL082
(OPERATIONAL AMPLIFIER)
(TOP VIEW)

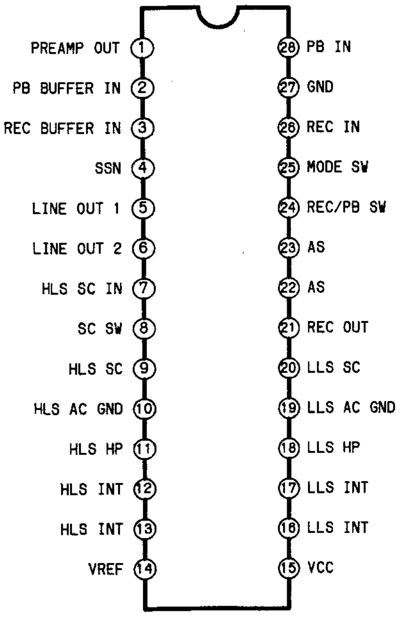




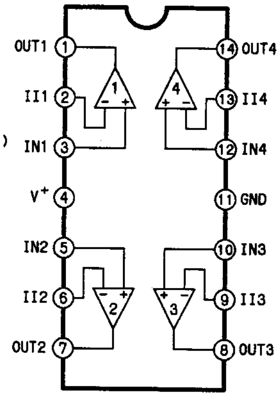
TD62781AP
(HIGH VOLTAGE SOURCE CURRENT DRIVER)



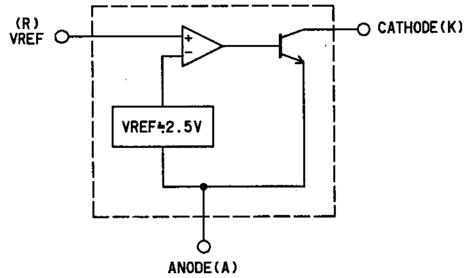
TEA0666T
(DOLBY B AND C TYPE NOISE REDUCTION CIRCUIT)

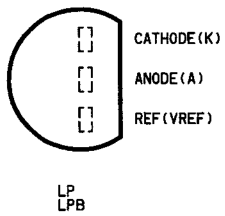


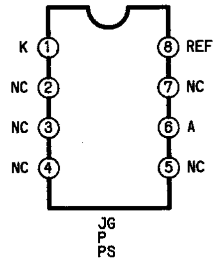
TL084
(OPERATIONAL AMPLIFIER)
(TOP VIEW)



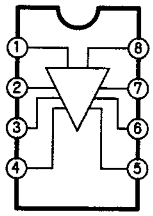
TL431
(ADJUSTABLE PRECISION SHUNT REGULATOR)

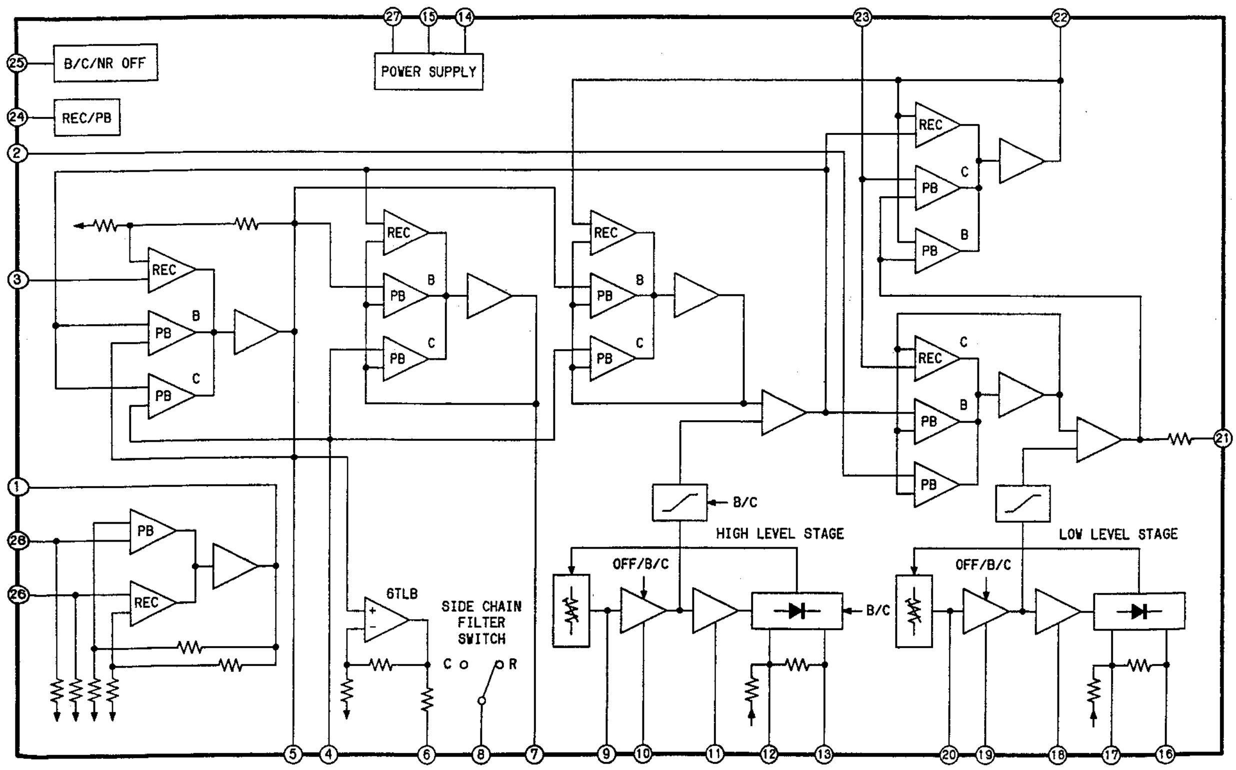




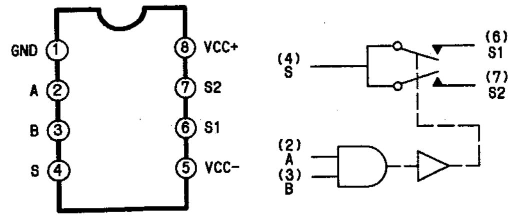


TL592
(WIDE BAND ADJUSTABLE GAIN VIDEO AMPLIFIER)
(TOP VIEW)



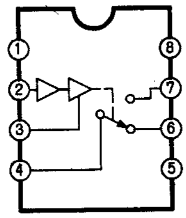


TL601
(ANALOG SWITCH)



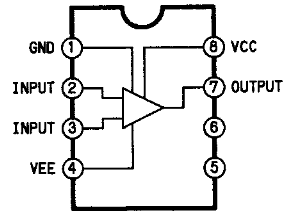
INPUT		ANALOG SW	
A	B	S1	S2
L	X	OFF(OPEN)	ON(CLOSED)
X	L	OFF(OPEN)	ON(CLOSED)
H	H	ON(CLOSED)	OFF(OPEN)

TL607
(ANALOG SWITCH)

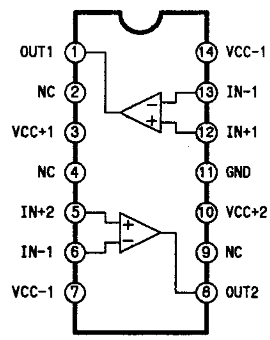


INPUT		ANALOG SW	
A	ENABLE	S1	S2
L	X	OFF(OPEN)	ON(CLOSED)
X	L	OFF(OPEN)	ON(CLOSED)
H	H	ON(CLOSED)	OFF(OPEN)

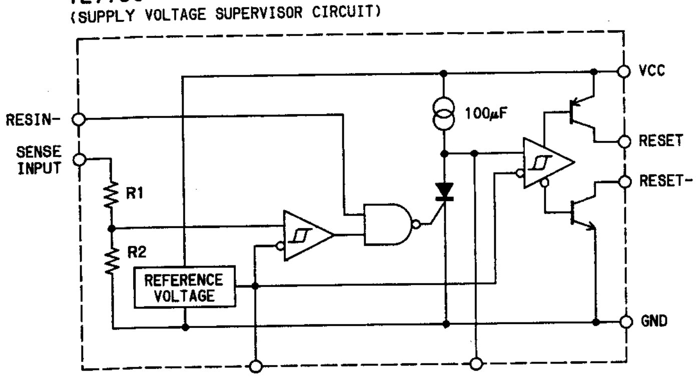
TL810
(HIGH SPEED COMPARATOR)
(TOP VIEW)



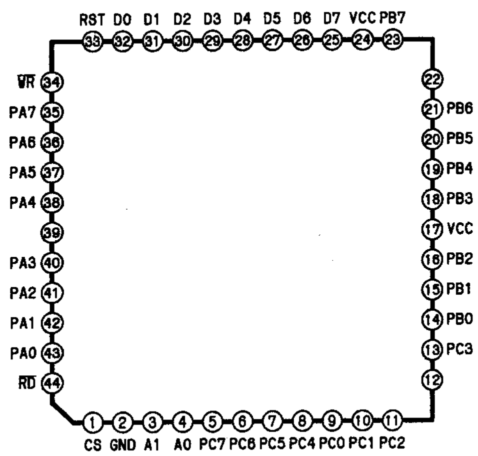
TL820
(HIGH SPEED COMPARATOR)
(TOP VIEW)

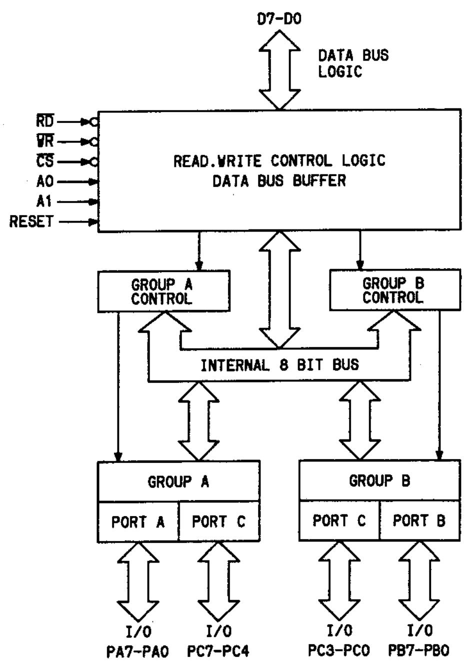


TL7705
(SUPPLY VOLTAGE SUPERVISOR CIRCUIT)

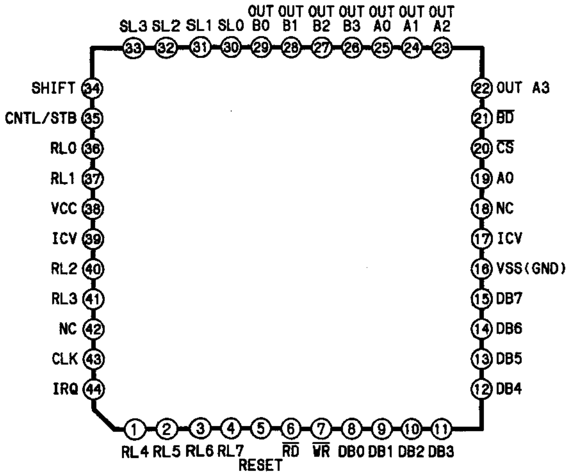


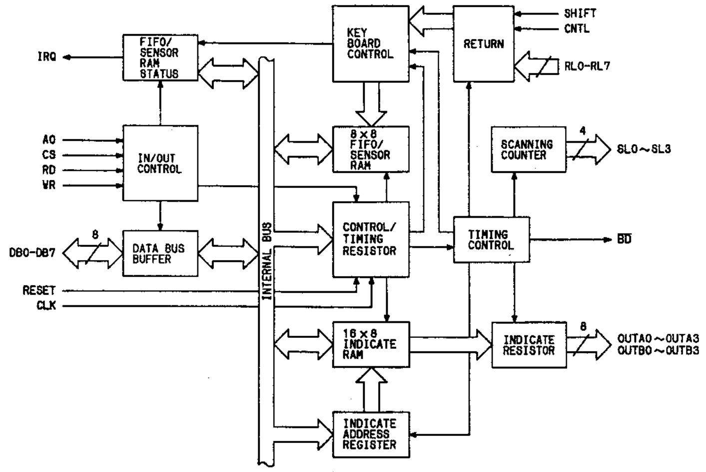
TMP82C55AF2
(CMOS PROGRAMMABLE PERIPHERAL INTERFACE)



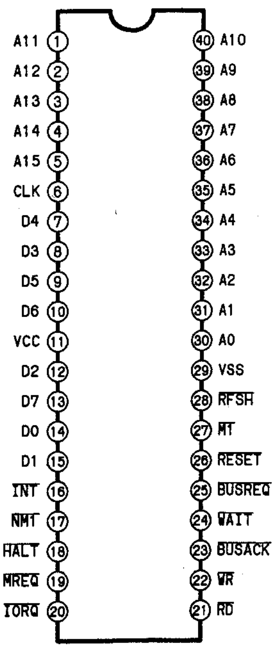


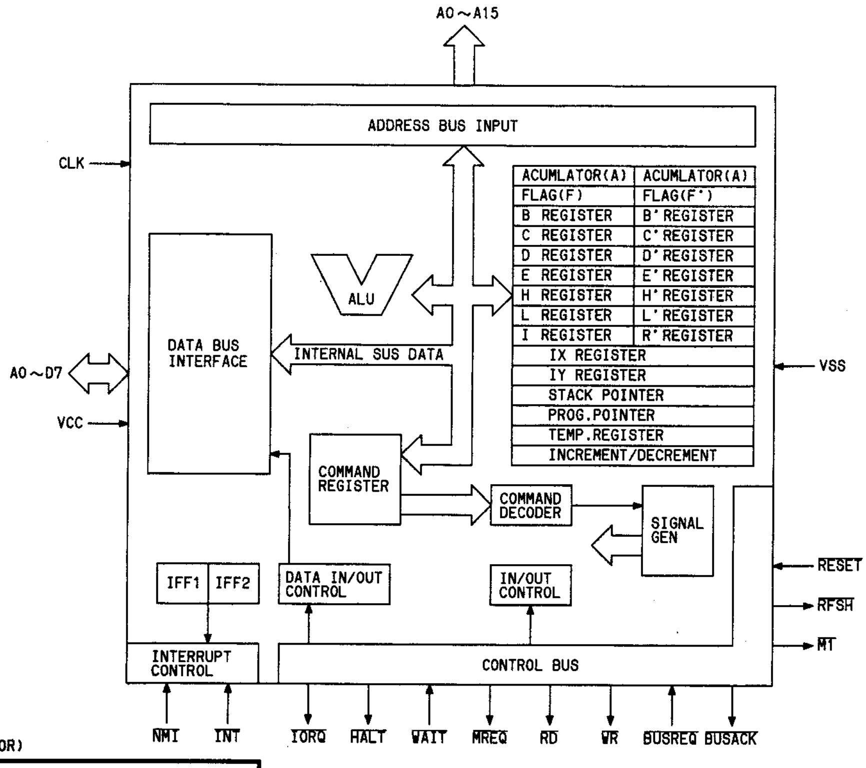
TMP82C79F2
(CMOS PROGRAMMABLE KEYBOARD/DISPLAY INTERFACE)



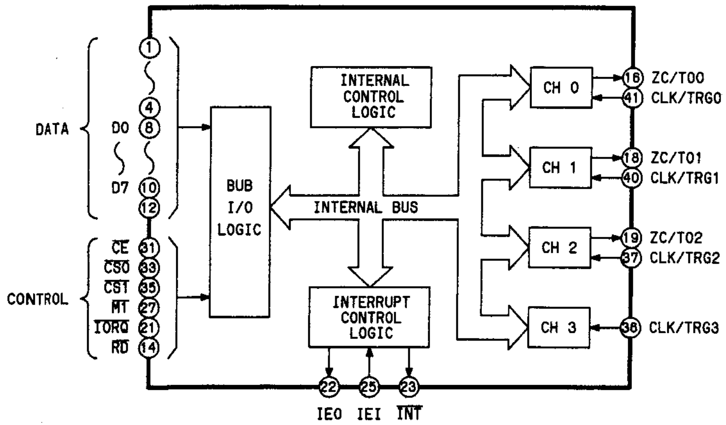


TMPZ84C00AP6
(CMOS 8-BIT MICRO PROCESSOR)

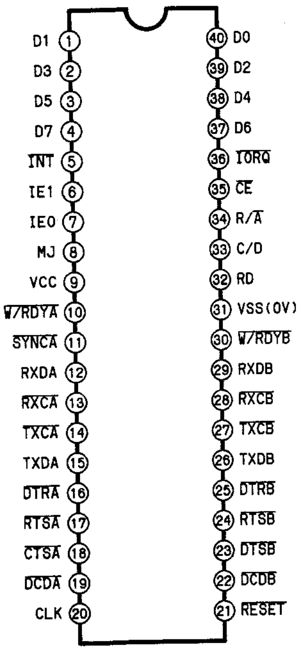


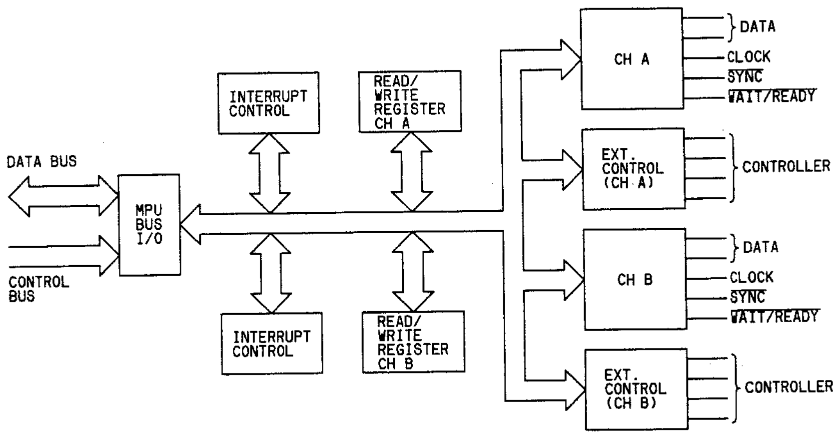


TMPZ84C02AF6
(CMOS 8-BIT MICRO PROCESSOR)

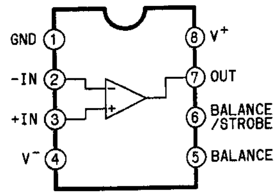


TMPZ84C40AP6
(SERIAL INPUT/OUTPUT CONTROLLER)

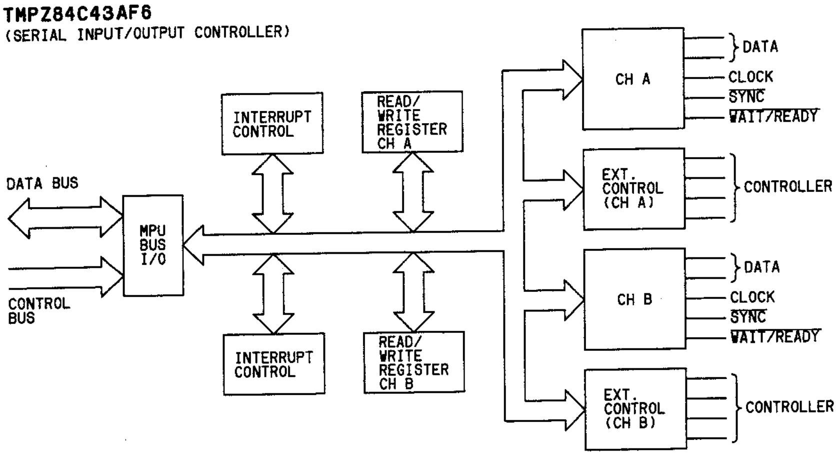




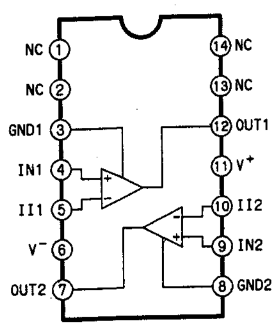
UPC311
(VOLTAGE COMPARATOR)
(TOP VIEW)



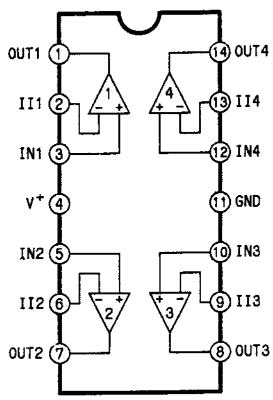
TMPZ84C43AF6
(SERIAL INPUT/OUTPUT CONTROLLER)



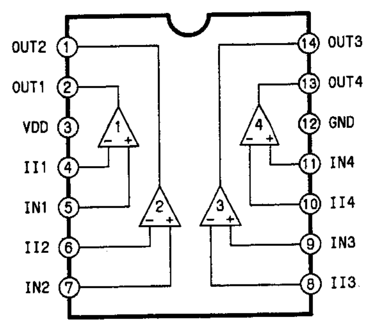
UPC319
(DUAL COMPARATOR)
(TOP VIEW)



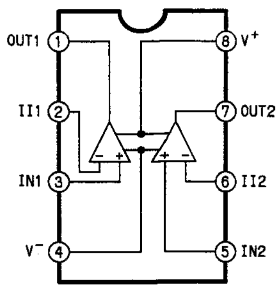
UPC324
(HIGH PERFORMANCE QUADRUPLE OPERATIONAL AMPLIFIER)
(TOP VIEW)



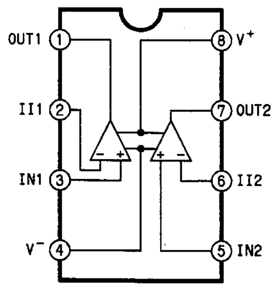
UPC339
(OPERATIONAL AMPLIFIER)
(TOP VIEW)



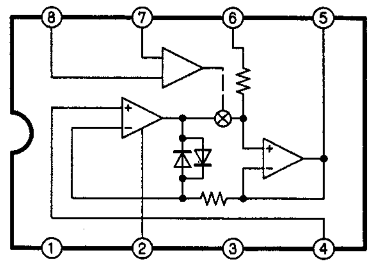
UPC358
(DUAL SINGLE-SUPPLY OPERATIONAL AMPLIFIER)
(TOP VIEW)



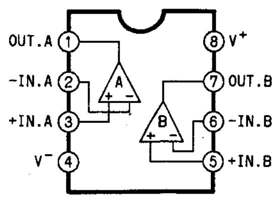
UPC393
(DUAL SINGLE-SUPPLY OPERATIONAL AMPLIFIER)
(TOP VIEW)



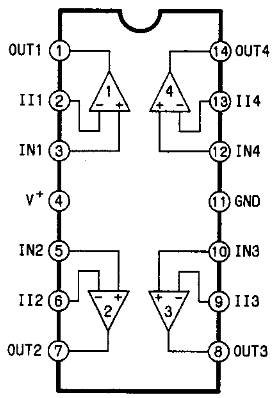
UPC398C
(SAMPLE AND HOLD CIRCUIT)



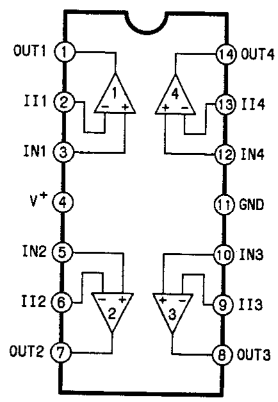
UPC4082
(OPERATIONAL AMPLIFIER)
(TOP VIEW)



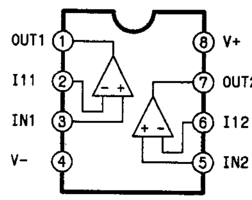
UPC4084
(OPERATIONAL AMPLIFIER)
(TOP VIEW)



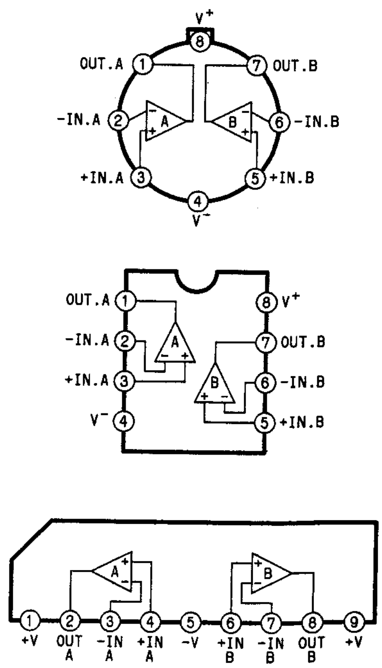
UPC451
(HIGH PERFORMANCE QUADRUPLE OPERATIONAL AMPLIFIER)
(TOP VIEW)



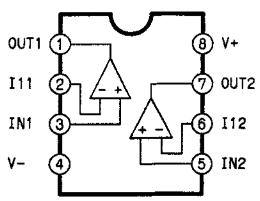
UPC4557
(OPERATIONAL AMPLIFIER)
(TOP VIEW)



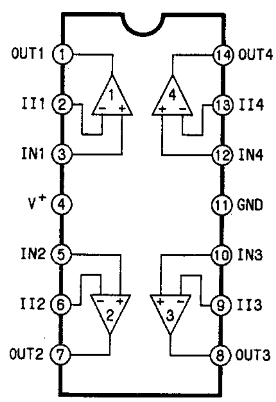
UPC4560
(OPERATIONAL AMPLIFIER)
(TOP VIEW)



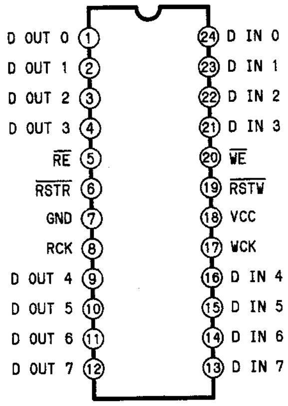
UPC4558
(OPERATIONAL AMPLIFIER)
(TOP VIEW)

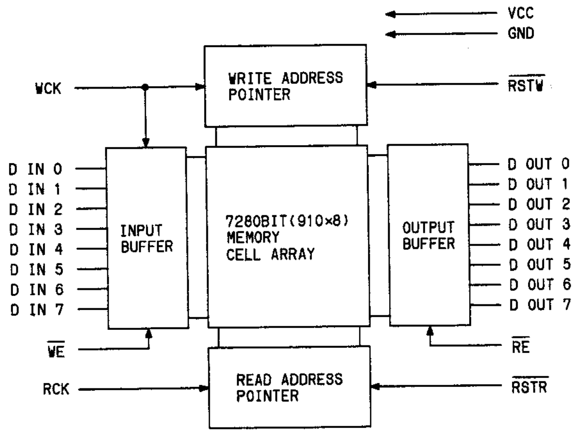


UPC4741
(OPERATIONAL AMPLIFIER)
(TOP VIEW)

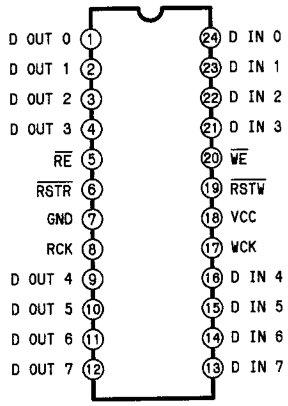


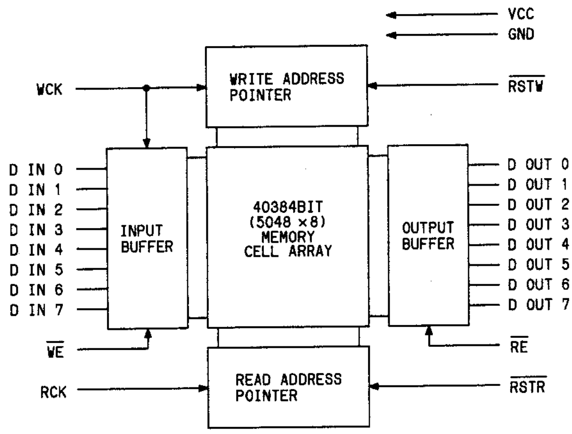
μPD41101C
(8-BIT FIFO MEMORY)



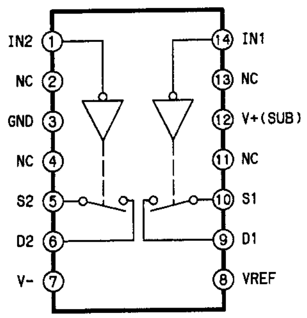


μPD42505C-50
(HIGH SPEED LINE BUFFER)





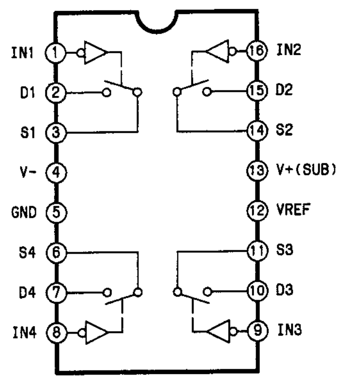
UPD5200C
(DUAL S.P.S.T CMOS ANALOG SWITCH)



INPUT	SWITCH
"L"	ON
"H"	OFF

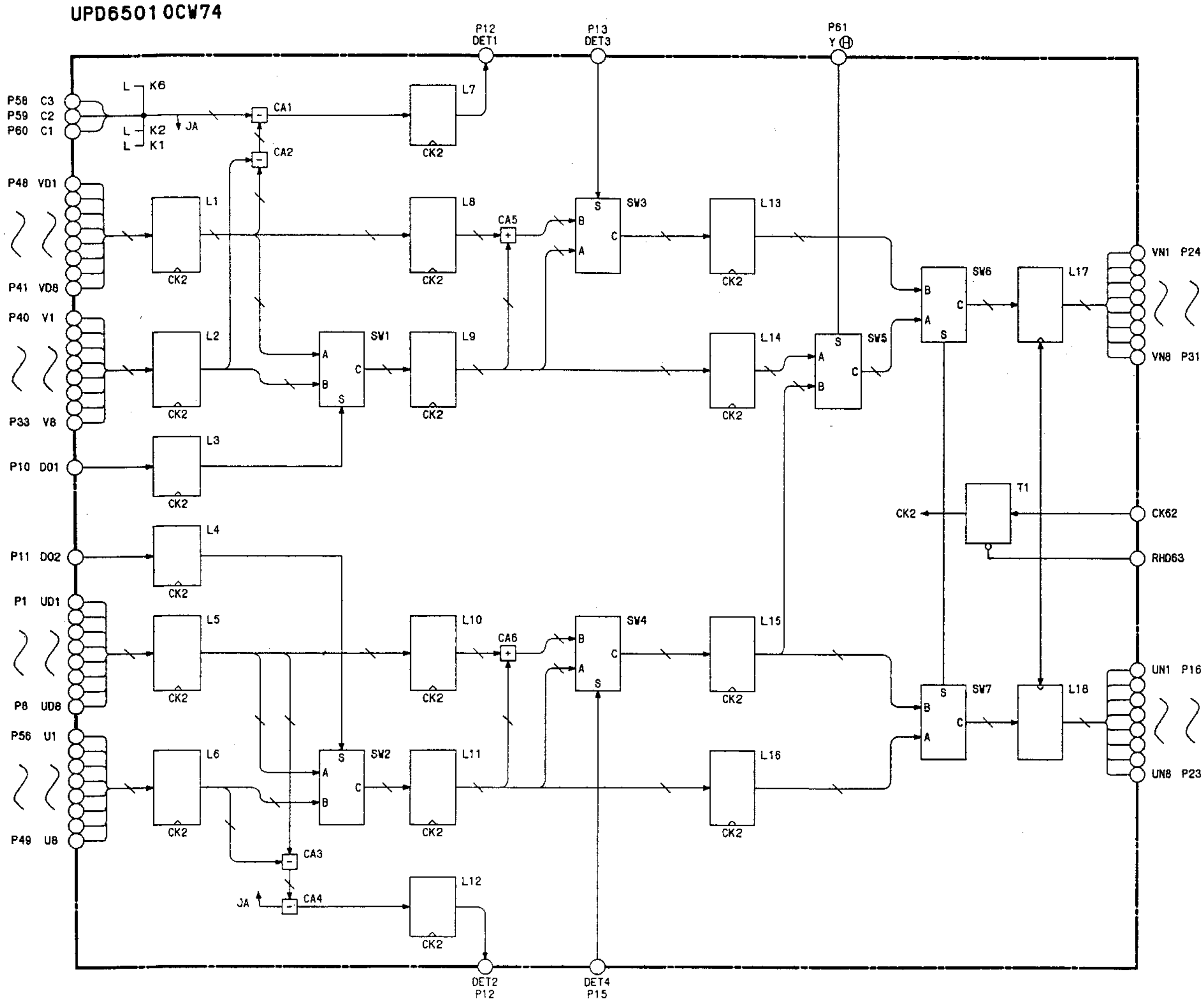
UPD5201C
(QUAD S.P.S.T CMOS ANALOG SWITCH)

(TOP VIEW)

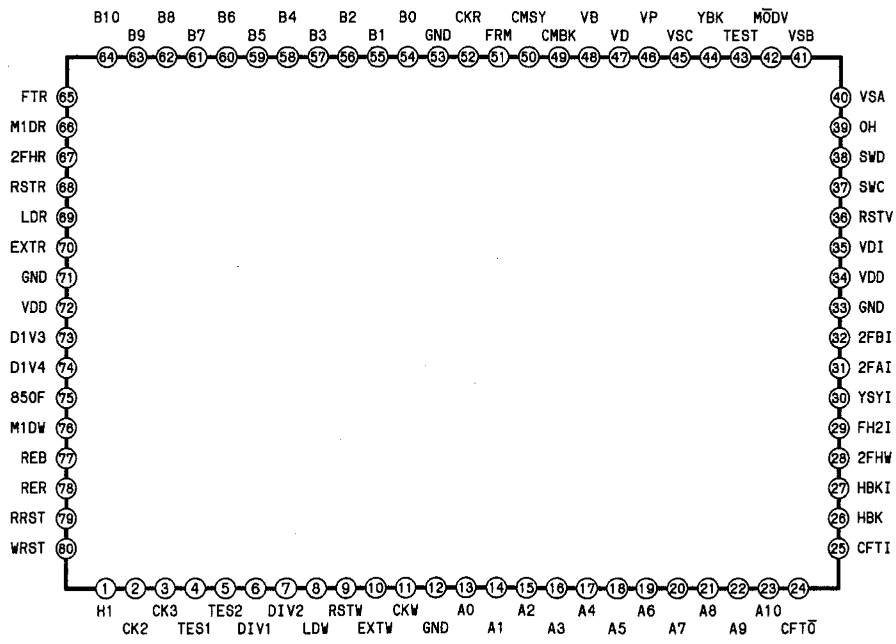


INPUT	SWITCH
"L"	ON
"H"	OFF

UPD65010CW74

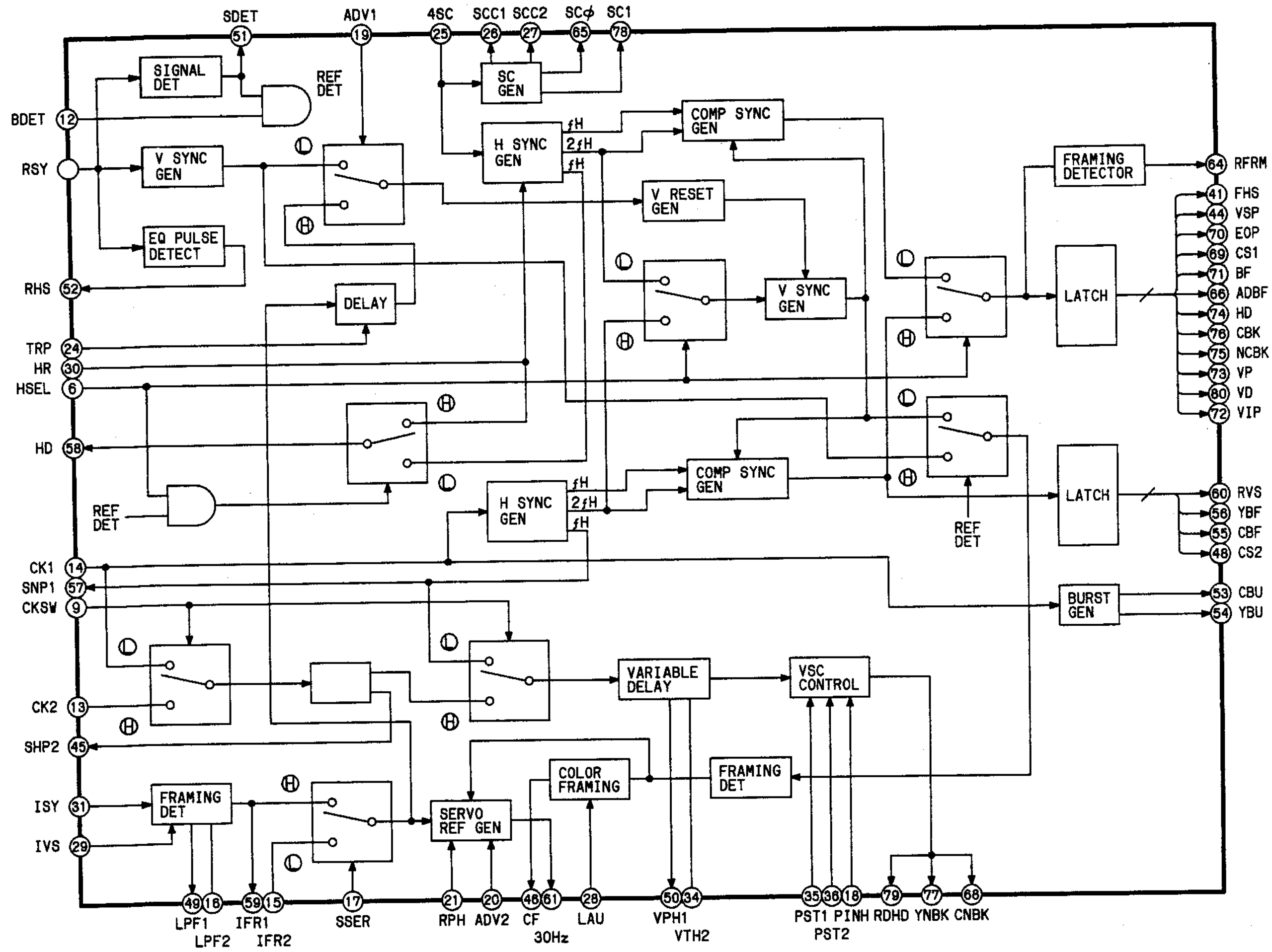


UPD65012
(SEMI-CUSTOM LSI)

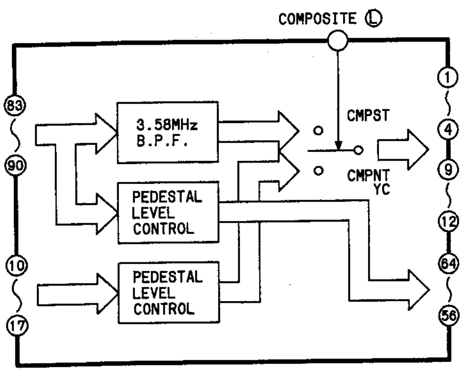


(G150/F150)

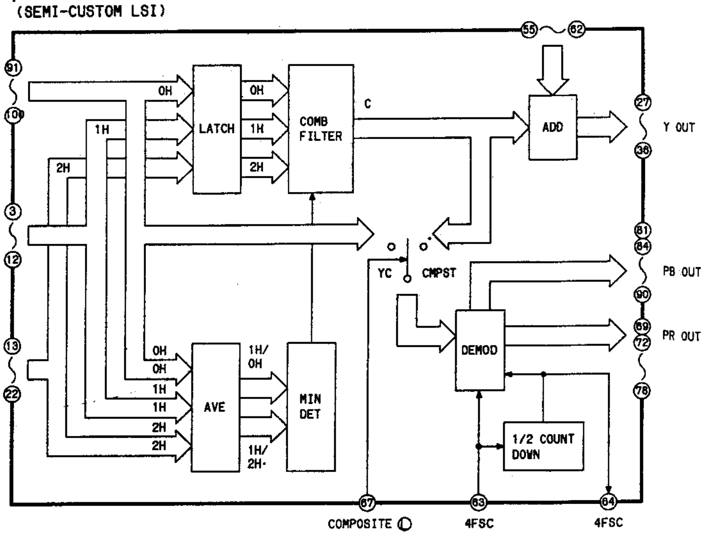
UPD65040G144



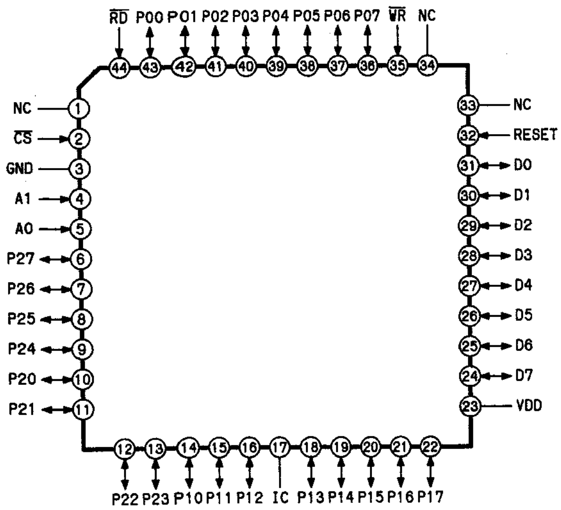
UPD65022G046



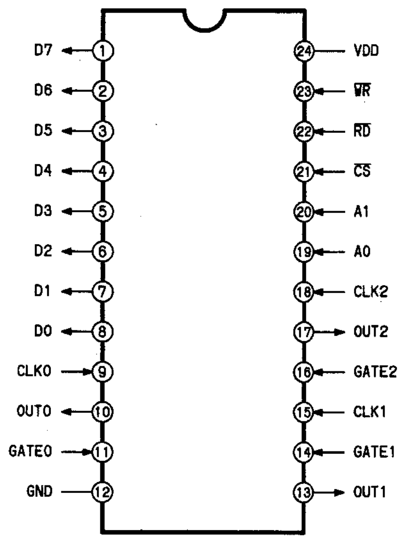
μPD65042G024
(SEMI-CUSTOM LSI)

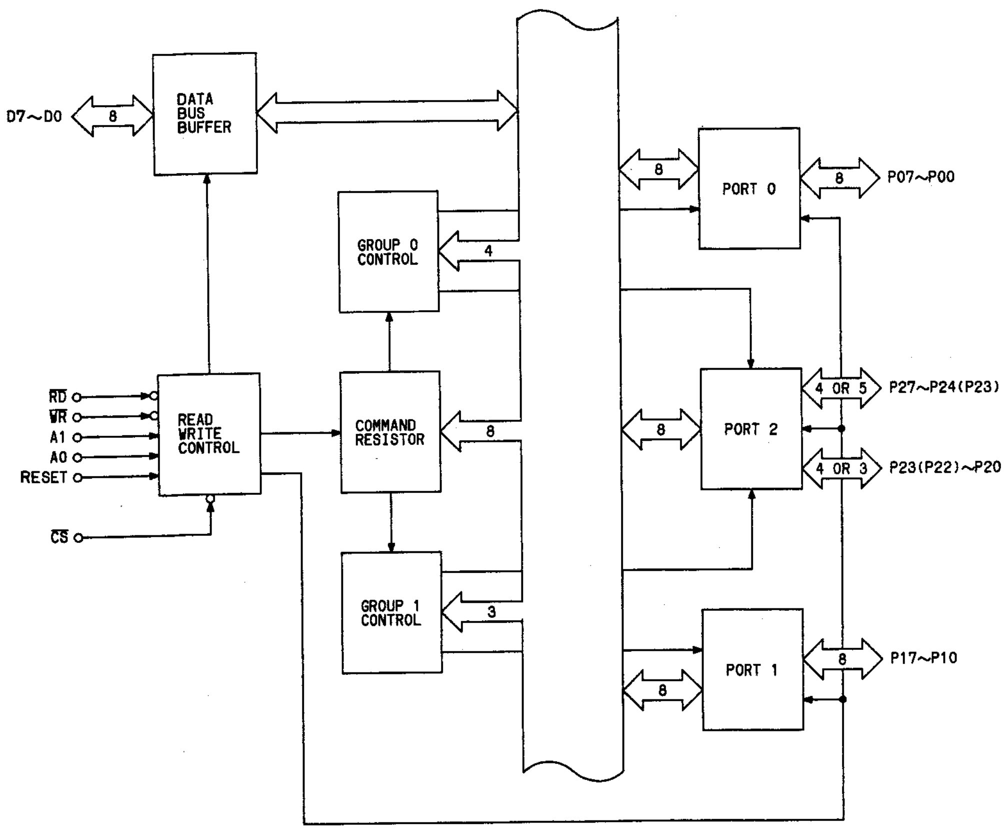


UPD71055G
(PARALLEL INTERFACE UNIT)

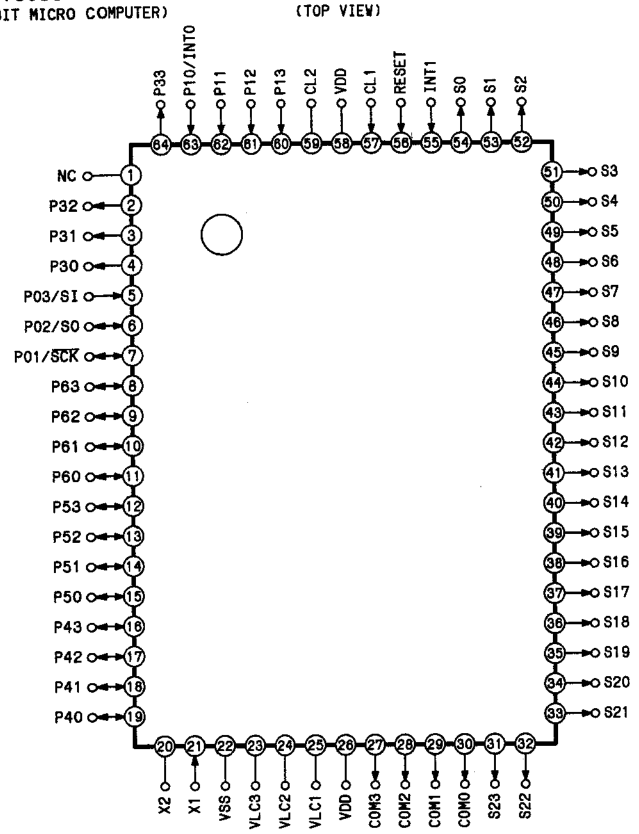


UPD71054G
(PROGRAMMABLE TIMER COUNTER)

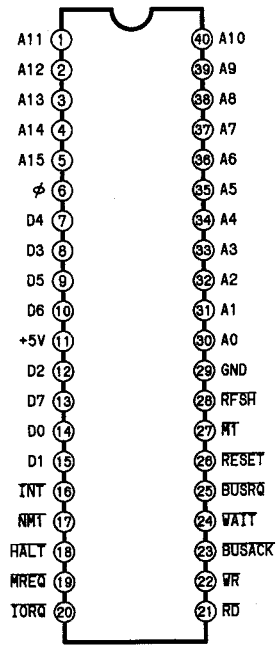


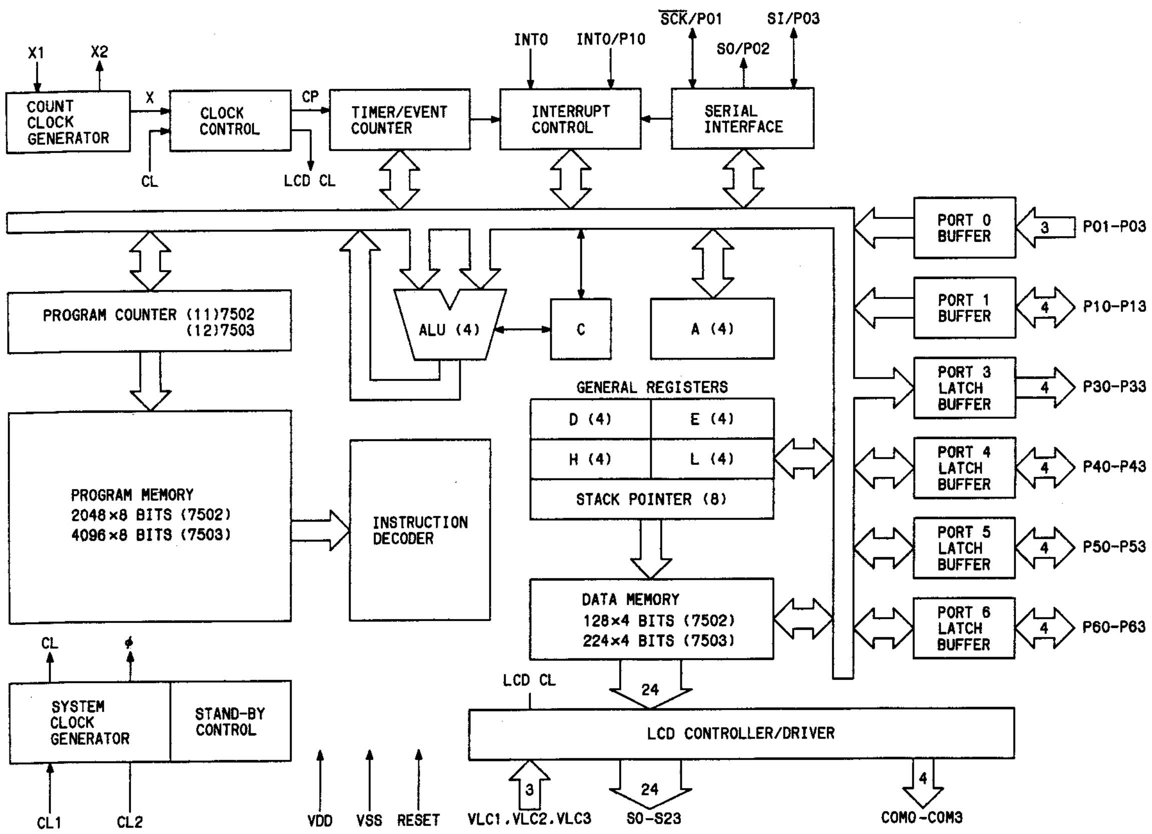


UPD7503G
(4-BIT MICRO COMPUTER) (TOP VIEW)

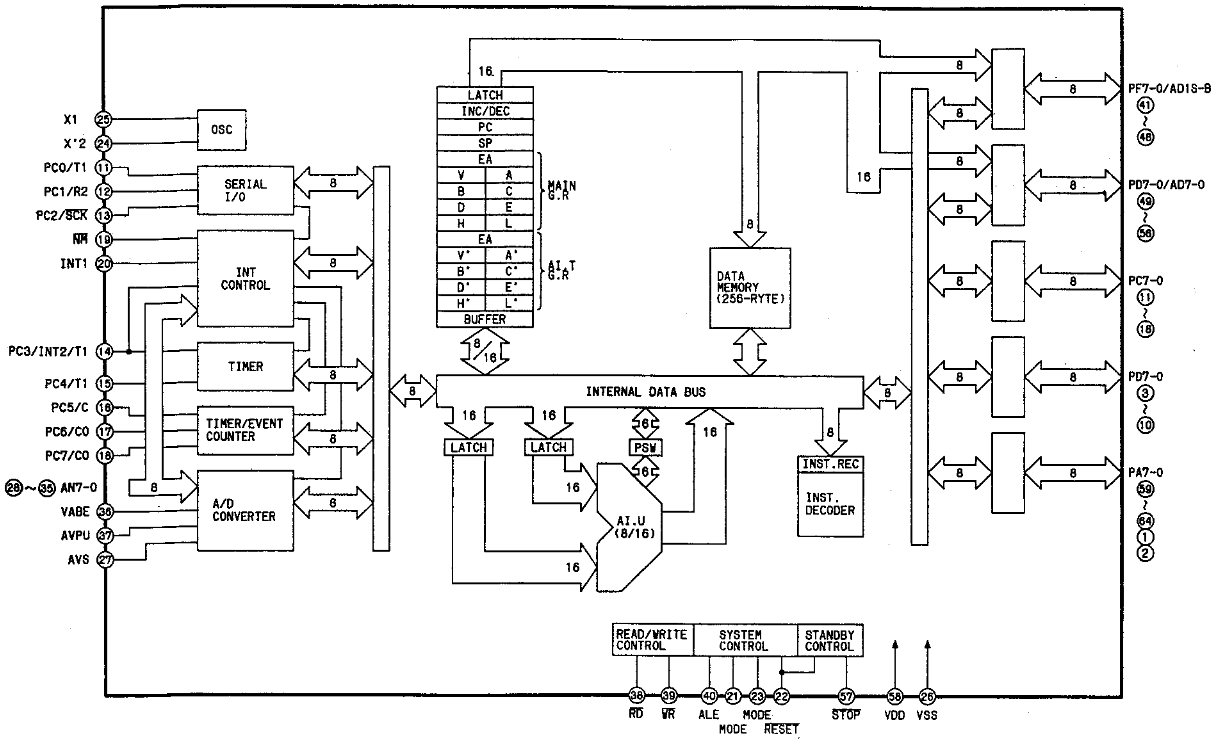


UPD780C
(COMPATIBLE NMOS 8-BIT MICROPROCESSOR)

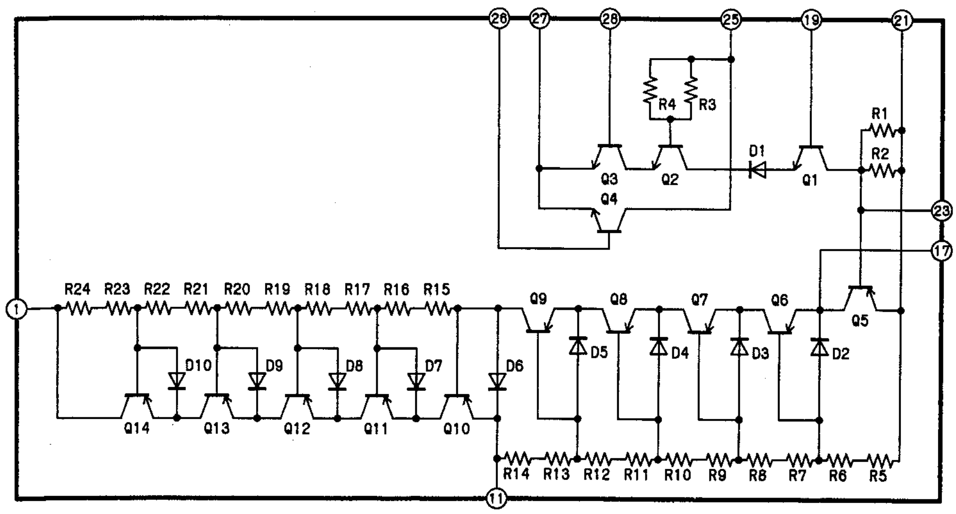




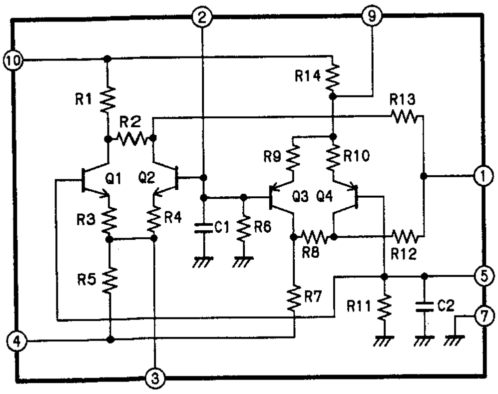
UPD78C10G
(8-BIT MICRO COMPUTER)



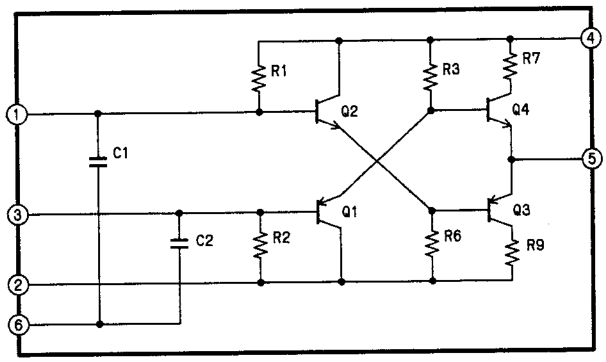
VCR0111
(DRIVE AMPLIFIER)



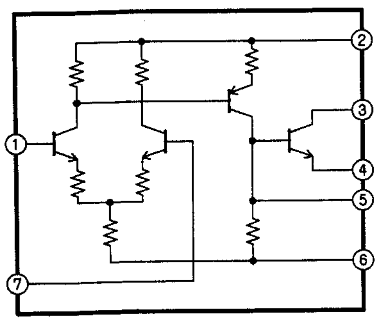
VCR0133
(VOLTAGE CONTROL AMPLIFIER)



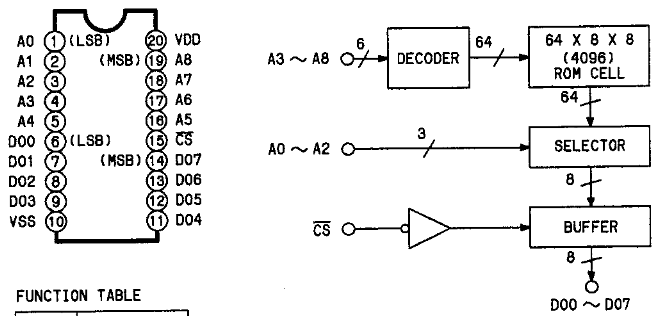
VCR0201



VCR0154
(AMPLIFIER)



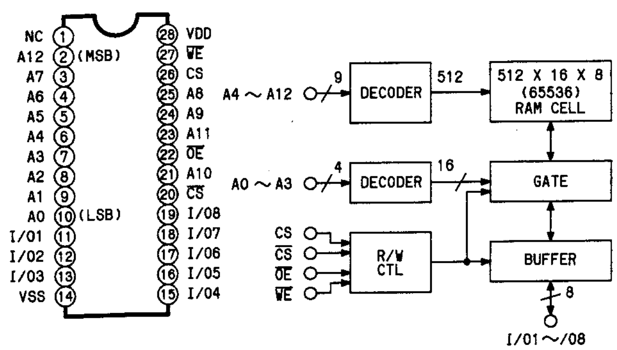
VSI0192
(4K TTL P-ROM)



FUNCTION TABLE

CS	FUNCTION
H	NON SELECT
L	READ

VSI0234
(64K CMOS STATIC RAM)

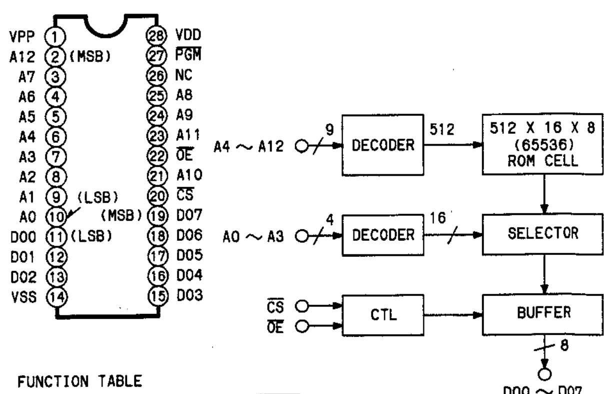


FUNCTION TABLE

INPUT			I/O		FUNCTION
CS	WE	OE	DI	DO	
H	X	X	X	HIGH-Z	NON SELECT
L	H	L	HIGH-Z	DO	READ
L	L	H	DI	HIGH-Z	WRITE
L	L	L	DI	HIGH-Z	WRITE
L	H	H	X	HIGH-Z	SELECT

CS=H

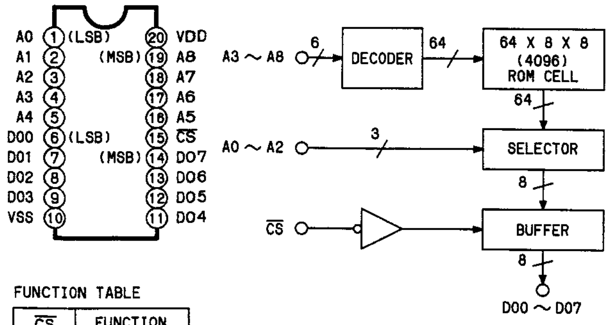
VSI0239
(64K CMOS UV-EPROM)



FUNCTION TABLE

INPUT		DO	FUNCTION
OE	CS/PGM		
X	H	HIGH-Z	NON SELECT
H	X	HIGH-Z	NON SELECT
L	L	DO	READ

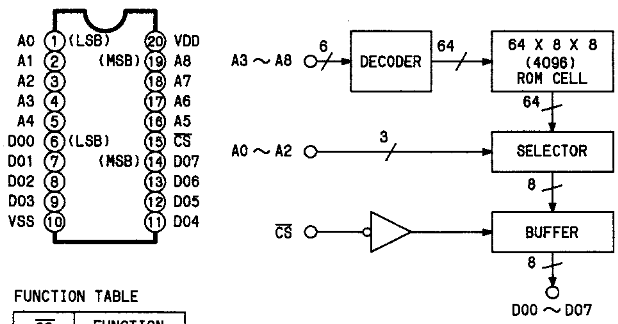
VSI0255
(4K TTL P-ROM)



FUNCTION TABLE

$\overline{CS}$	FUNCTION
H	NON SELECT
L	READ

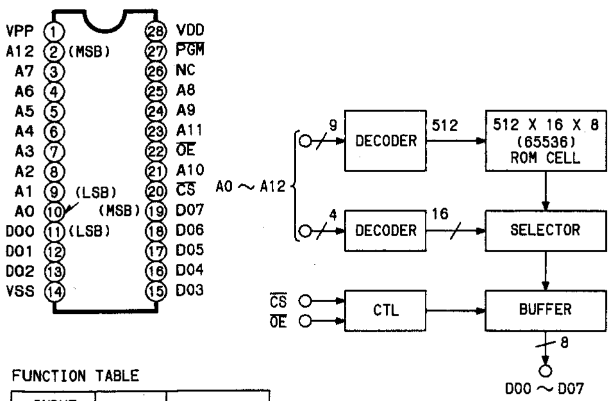
VSI0256
(4K TTL P-ROM)



FUNCTION TABLE

$\overline{CS}$	FUNCTION
H	NON SELECT
L	READ

VSI0257
(64K nMOS UV-EPROM)



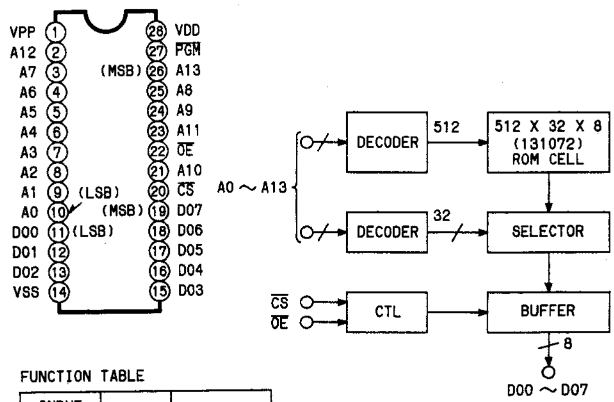
FUNCTION TABLE

INPUT		DO	FUNCTION
$\overline{CS}$	$\overline{OE}$		
H	X	HIGH-Z	STAND BY
L	H	HIGH-Z	OPERATING
L	L	DO	OPERATING

$\overline{PGM}$-VIH

VSI0322
(128K nMOS UV-EPROM)

(TOP VIEW)



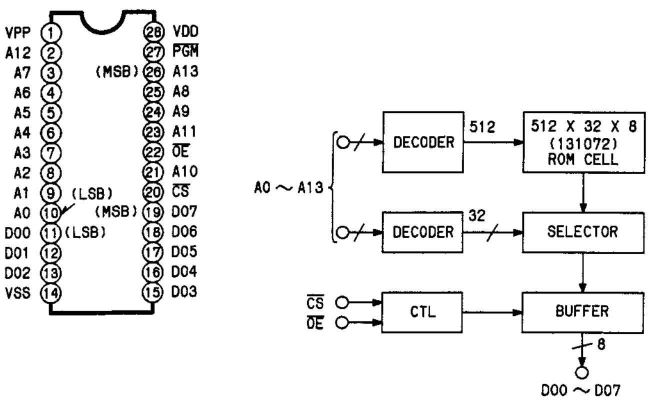
FUNCTION TABLE

INPUT		DO	FUNCTION
$\overline{CS}$	$\overline{OE}$		
H	X	HIGH-Z	STAND BY
L	H	HIGH-Z	OPERATING
L	L	DO	OPERATING

$\overline{PGM}$-VIH

VSI0327A
(128K nMOS UV-EPROM)

(TOP VIEW)



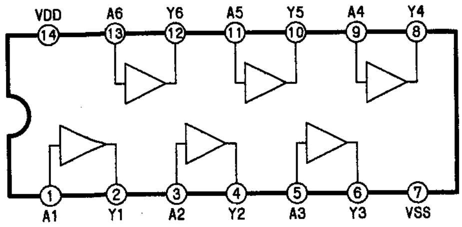
FUNCTION TABLE

INPUT		DO	FUNCTION
$\overline{CS}$	$\overline{OE}$		
H	X	HIGH-Z	STAND BY
L	H	HIGH-Z	OPERATING
L	L	DO	OPERATING

$\overline{PGM}$-VIH

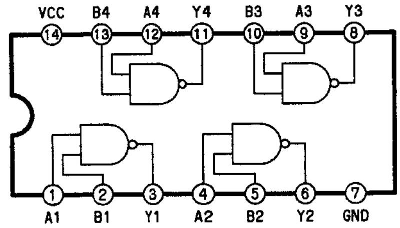
7407
(HEX.BUFFER)

(TOP VIEW)



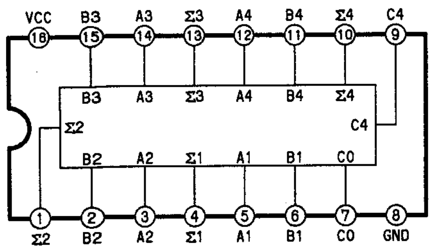
7437
(QUAD 2-INPUT NAND BUFFER)

(TOP VIEW)



74283
(4-BIT BINARY ADDER WITH FAST CARRY)

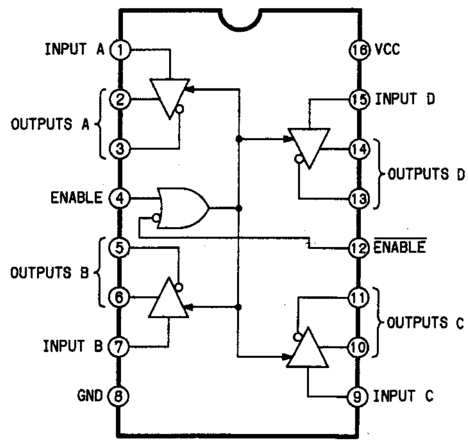
(TOP VIEW)



FUNCTION TABLE

INPUT				OUTPUT					
				WHEN C0=L / WHEN C2=L			WHEN C0=H / WHEN C2=H		
A1 / A3	B1 / B3	A2 / A4	B2 / B4	Σ1 / Σ3	Σ2 / Σ4	C2 / C4	Σ1 / Σ3	Σ2 / Σ4	C2 / C4
L	L	L	L	L	L	L	H	L	L
H	L	L	L	H	L	L	L	H	L
L	H	L	L	H	L	L	L	H	L
H	H	L	L	L	H	L	H	H	L
L	L	H	L	L	H	L	H	H	L
H	L	H	L	H	H	L	L	L	H
L	H	H	L	H	H	L	L	L	H
H	H	H	L	L	L	H	H	L	H
L	L	L	H	L	H	L	H	H	L
H	L	L	H	H	H	L	L	L	H
L	H	L	H	H	H	L	L	L	H
H	H	L	H	L	L	H	H	L	H
L	L	H	H	L	L	H	H	L	H
H	L	H	H	H	L	H	L	H	H
L	H	H	H	H	L	H	L	H	H
H	H	H	H	L	H	H	H	H	H

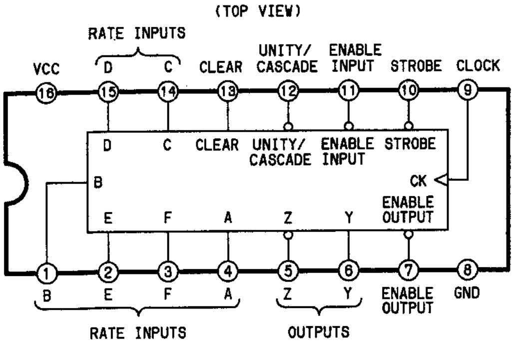
AM26LS31PC
(QUAD DIFF LINE(RS422)DRIVER)



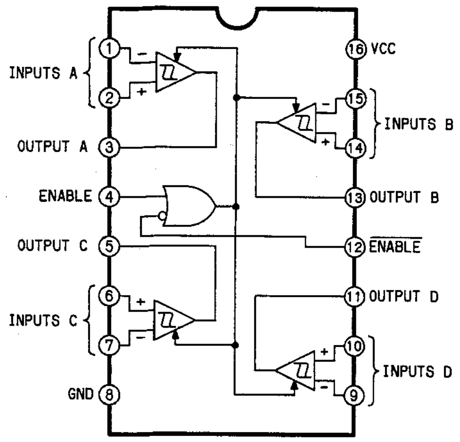
TRUTH TABLE			
IN	CONTROL (E/Ē)	NON-INVERTING OUTPUT	INVERTING OUTPUT
H	H/L	H	L
L	H/L	L	H
X	L/H	Z	Z

7497
(6-BIT SYNCHRONOUS BINARY RATE MULTIPLIERS)

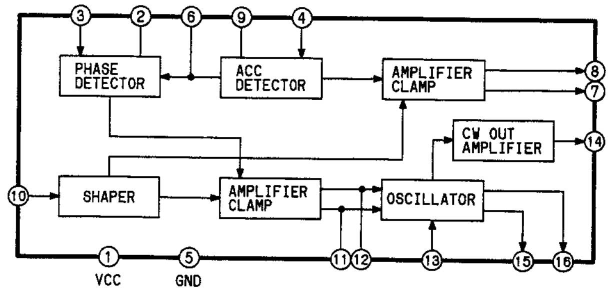
(TOP VIEW)



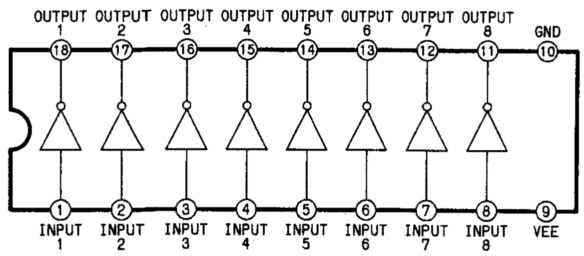
AM26LS32PC
(QUAD DIFF LINE(RS422/423)RECEIVER)



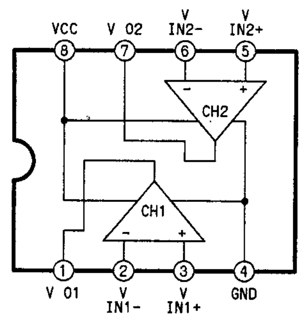
AN236
(COLOR TV SUBCARRIER PROCESSING CIRCUIT)



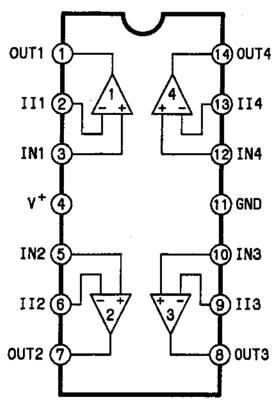
AN6873N
(FLUORESCENT DISPLAY TUBE DRIVER CIRCUITS)



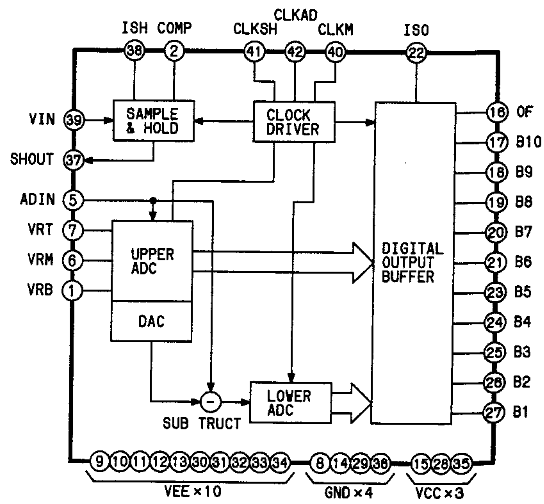
AN6914
(DUAL COMPARATOR)



HA17902
(OPERATIONAL AMPLIFIER)
(TOP VIEW)

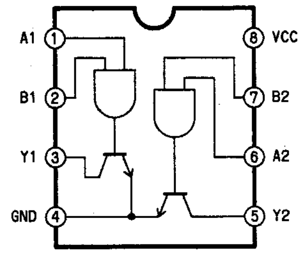


HA19214
(10-BIT SERIES-PARALLEL TYPE A/D CONVERTER)



HD75452
(DUAL PERIPHERAL POSITIVE NAND DRIVER)

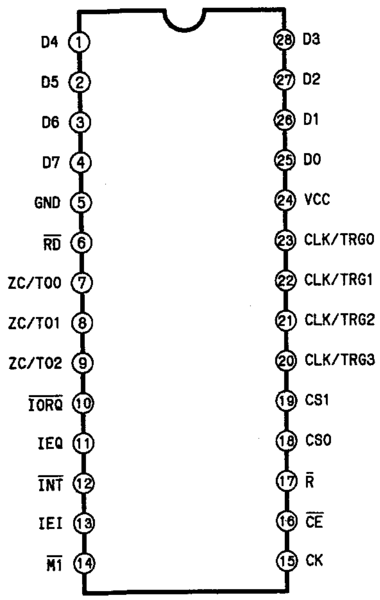
(TOP VIEW)

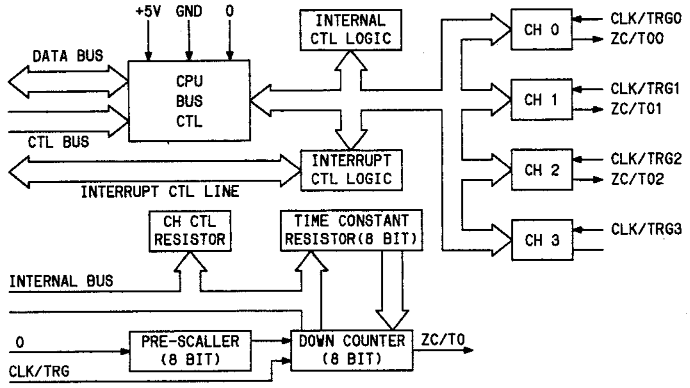


TRUTH TABLE

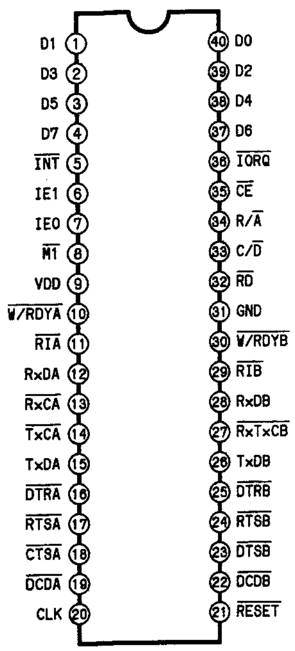
A	B	Y
L	L	H (OFF STATE)
L	H	H (OFF STATE)
H	L	H (OFF STATE)
H	H	L (ON STATE)

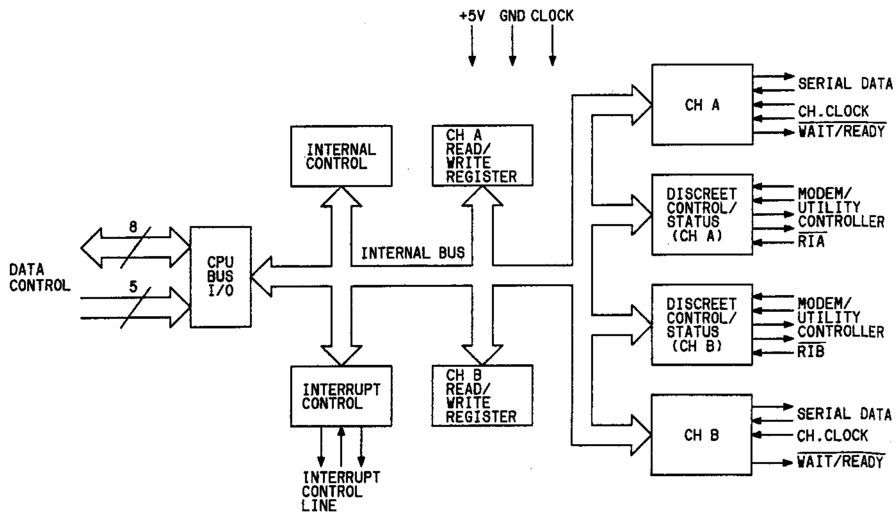
LH0082A
(COUNTER TIMER CIRCUIT)



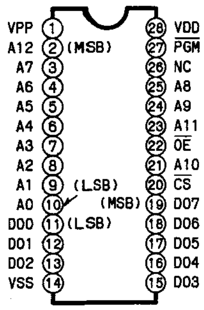


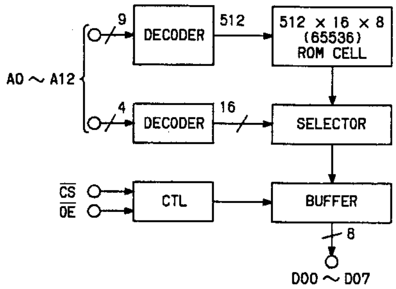
LH0088A
(DATA CONVERTER)





MBM276425
(64K nMOS UV-EPROM)



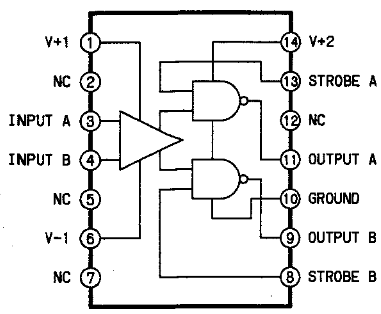


FUNCTION TABLE

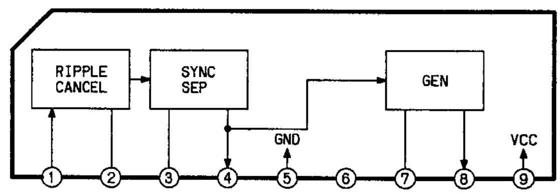
INPUT		DO	FUNCTION
CS	OE		
H	X	HIGH-Z	STAND BY
L	H	HIGH-Z	OPERATING
L	L	DO	OPERATING

PGM=VIH

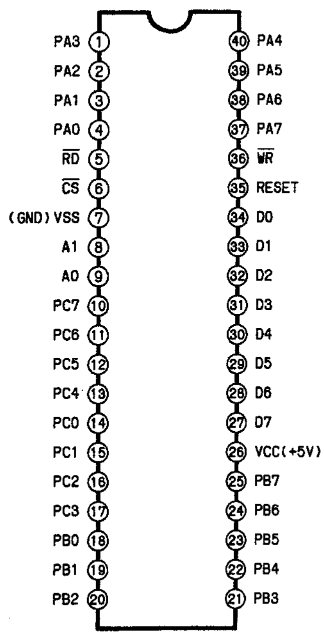
NE529
(VOLTAGE COMPARATOR)

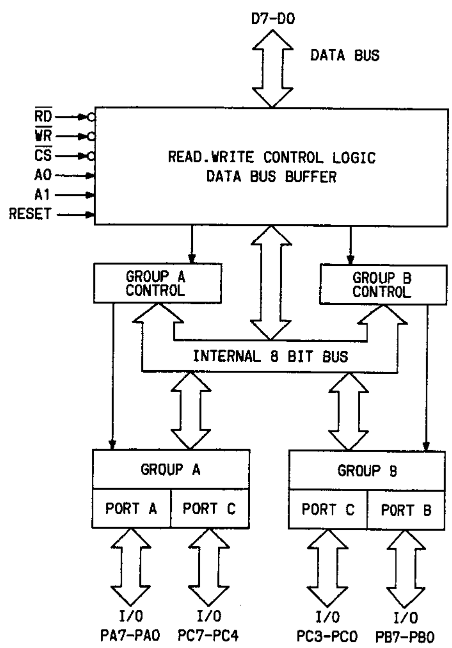


TA7357P
(SYNC SEPARATOR/HD PULSE GEN.)

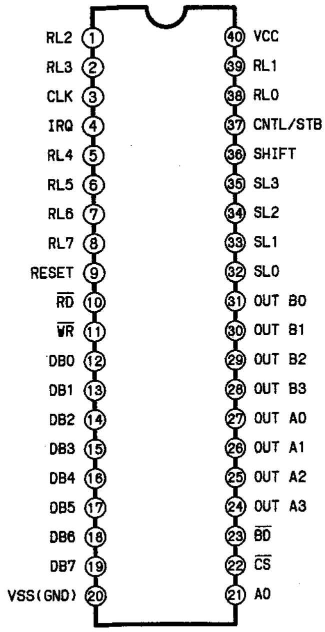


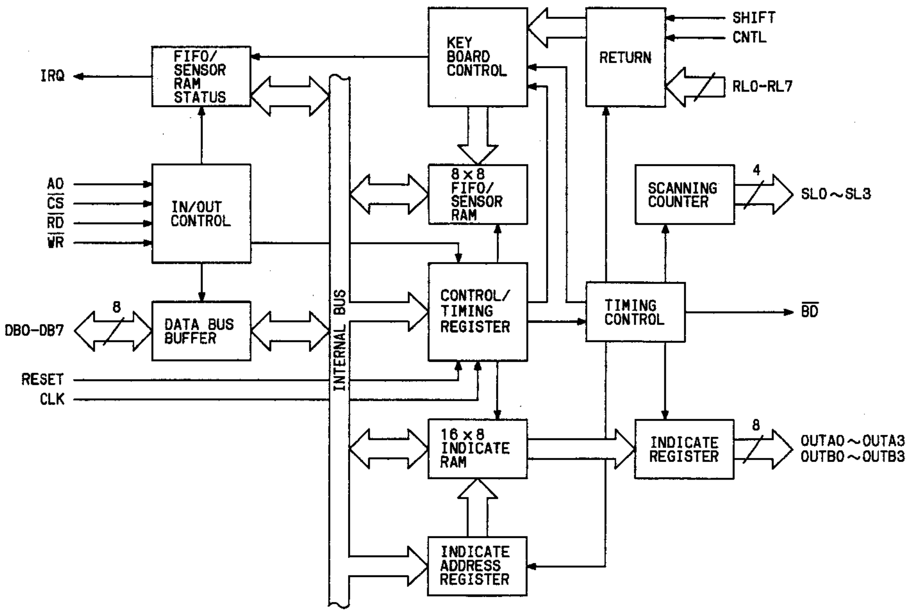
TMP82C55AP2
(CMOS PROGRAMMABLE PERIPHERAL INTERFACE)



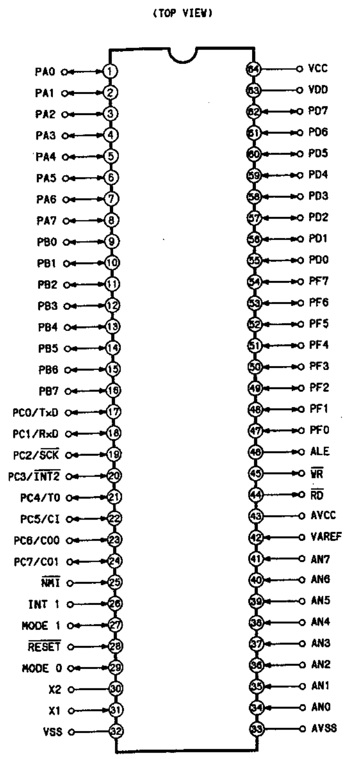


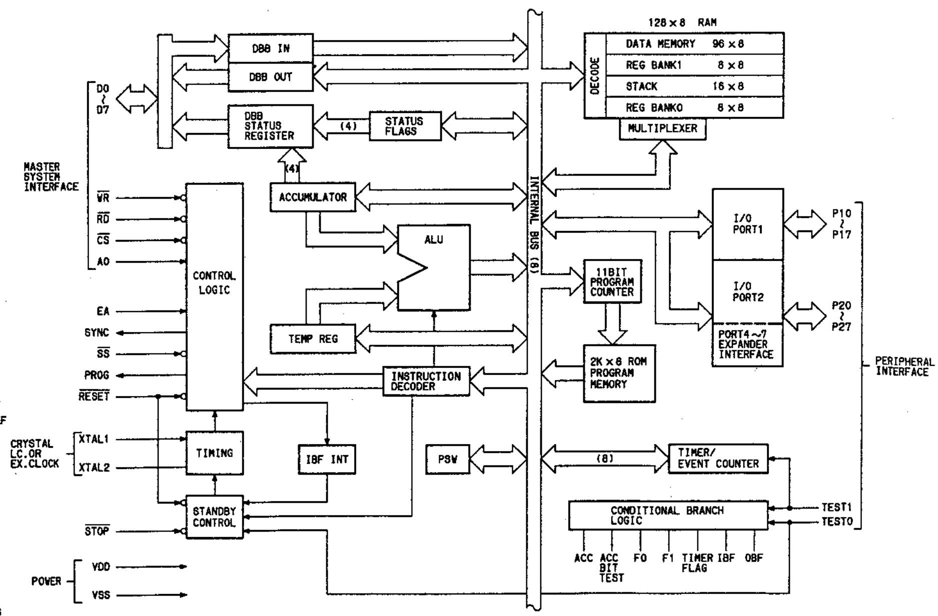
TMP82C79P2
(CMOS PROGRAMMABLE KEYBOARD/DISPLAY INTERFACE)



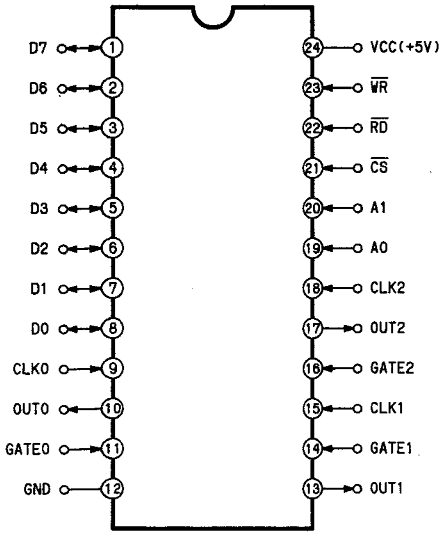


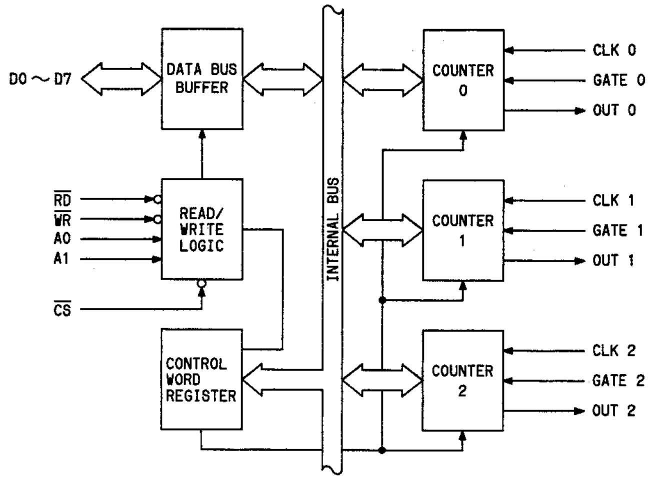
UPD7810CW
(8-BIT MICRO COMPUTER)



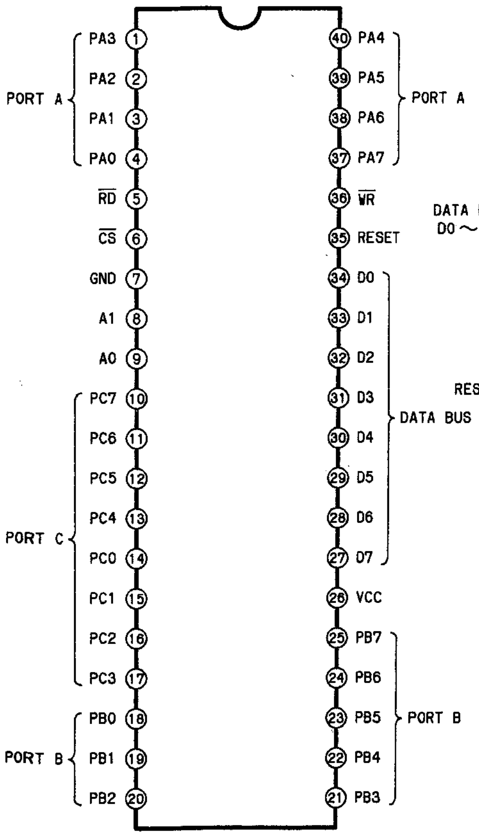


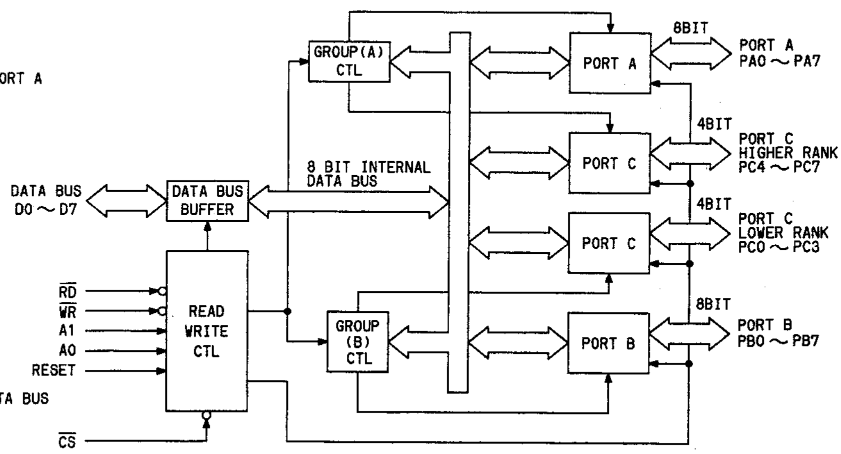
UPD8253C
(PROGRAMMABLE INTERVAL TIMER)
(TOP VIEW)



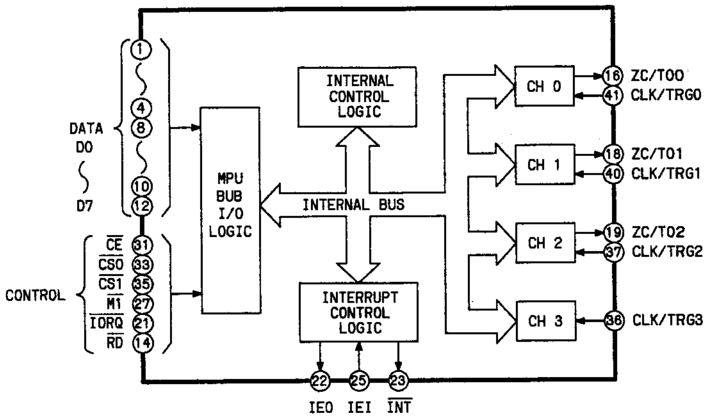


UPD8255AC
(PROGRAMMABLE PERIPHERAL INTERFACE)

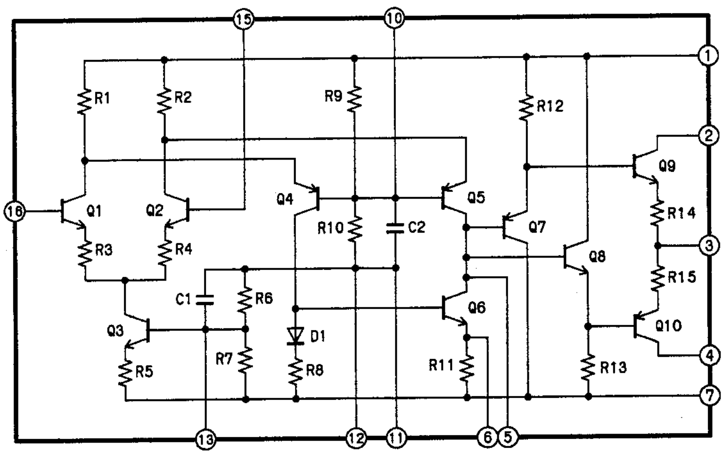




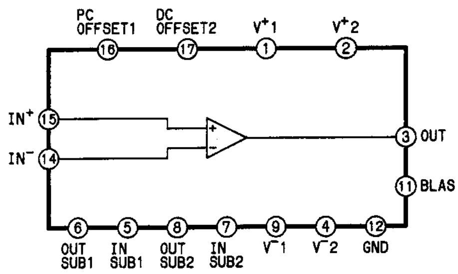
TMPZ84C30AP6
(COUNTER TIMER CIRCUIT)



VCR0109
(VIDEO AMPLIFIER)

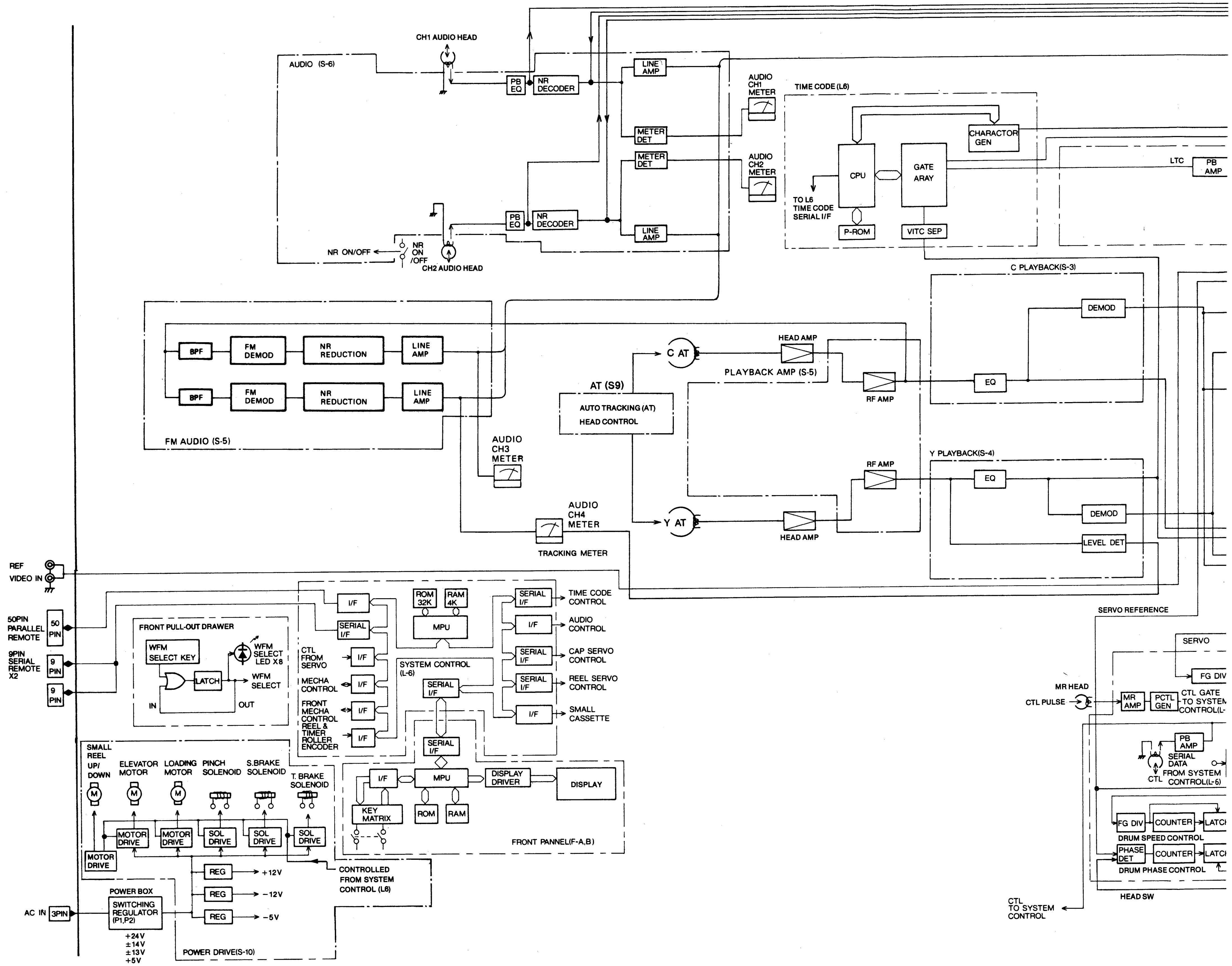


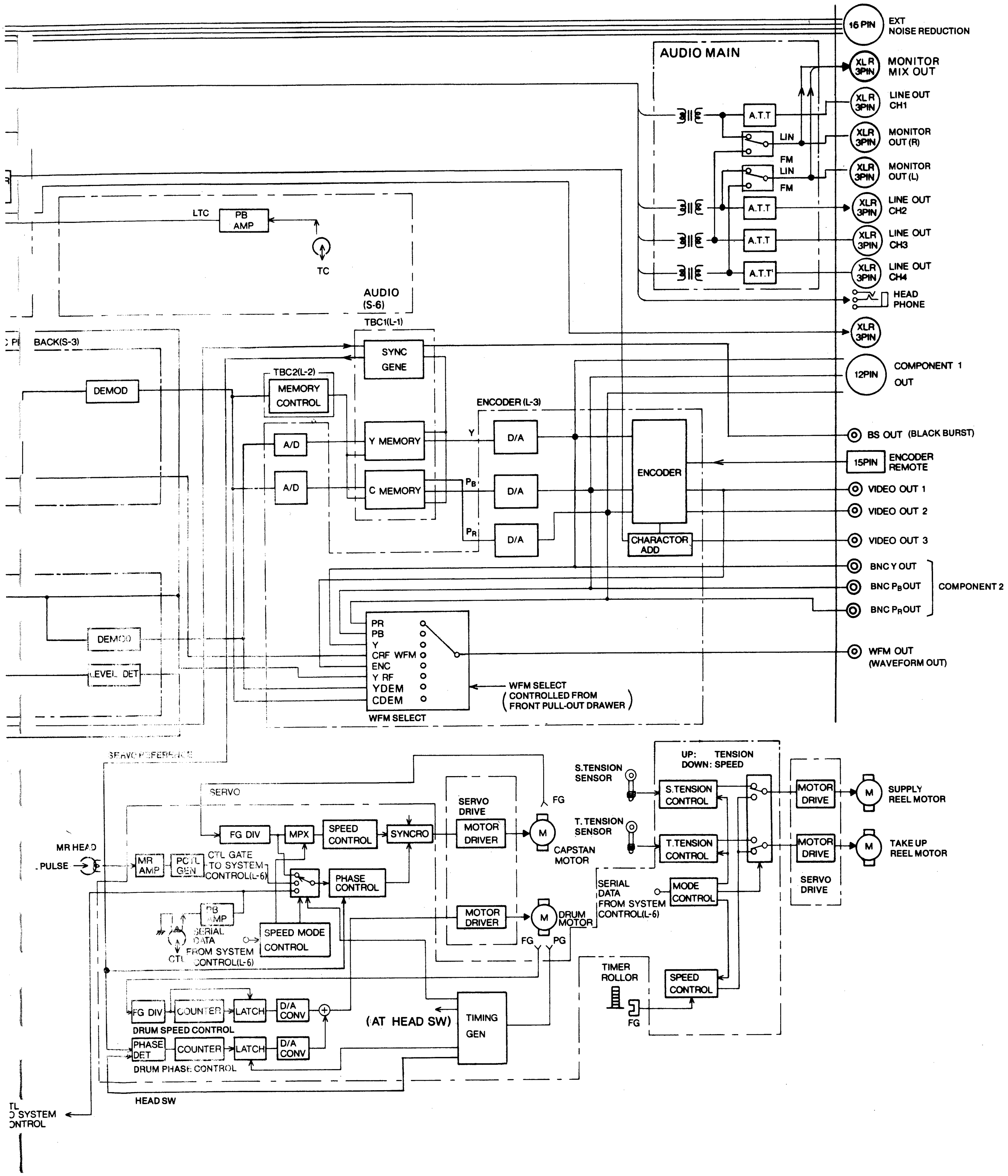
VCR0134
(HIGH-BAND VIDEO AMPLIFIER)

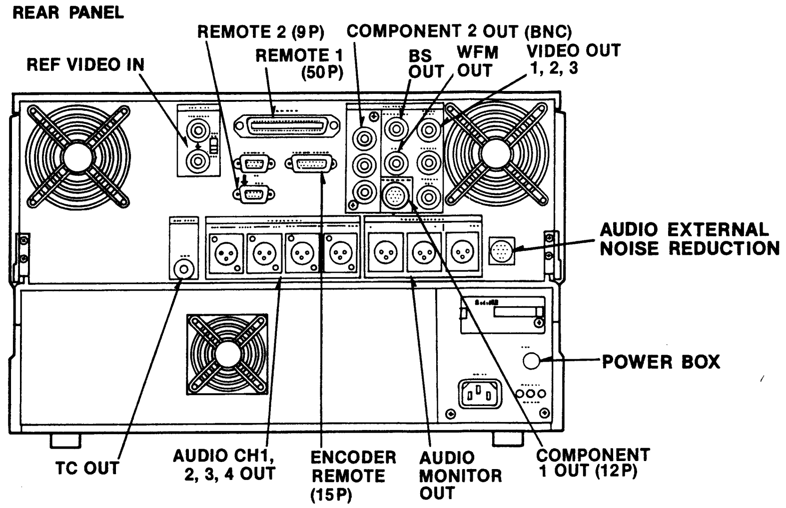


OVERALL BLOCK DIAGRAM

NO.	BOARD NAME
L0	L MOTHER
L1	TBC1, SYNC GENE
L2	TBC2
L3	ENCODER, D/A, A/D
L4	NOT MOUNTED
L5	SERVO
L6	SYSTEM CONTROL, TIME CODE
S0	S MOTHER
S1	NOT MOUNTED
S2	NOT MOUNTED
S3	C PLAYBACK
S4	Y PLAYBACK
S5	PLAY AMP, FM AUDIO
S6	AUDIO
S7	NOT MOUNTED
S8	NOT MOUNTED
S9	AUTO TRACKING
S10	POWER DRIVE
FRONT PANEL A, B	
FRONT PULL-OUT DRAWER	
POWER BOX	
AUDIO MAIN	

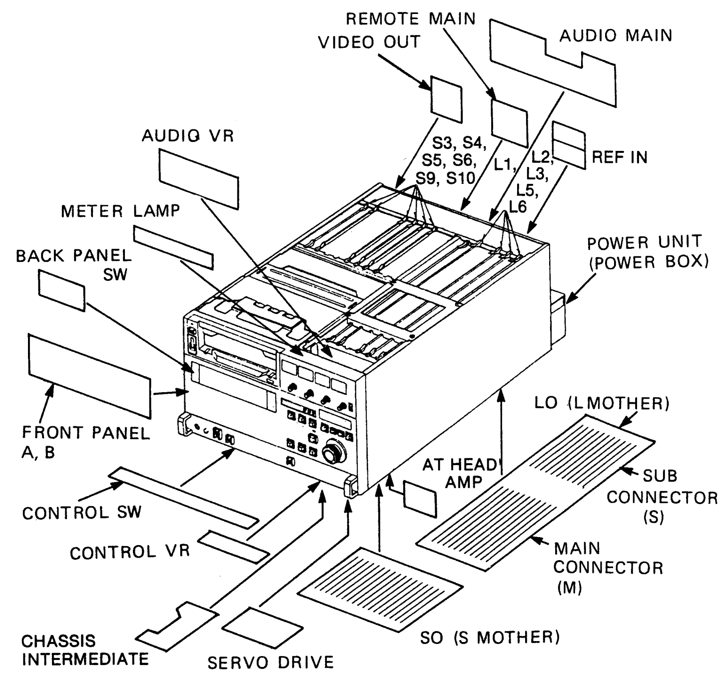




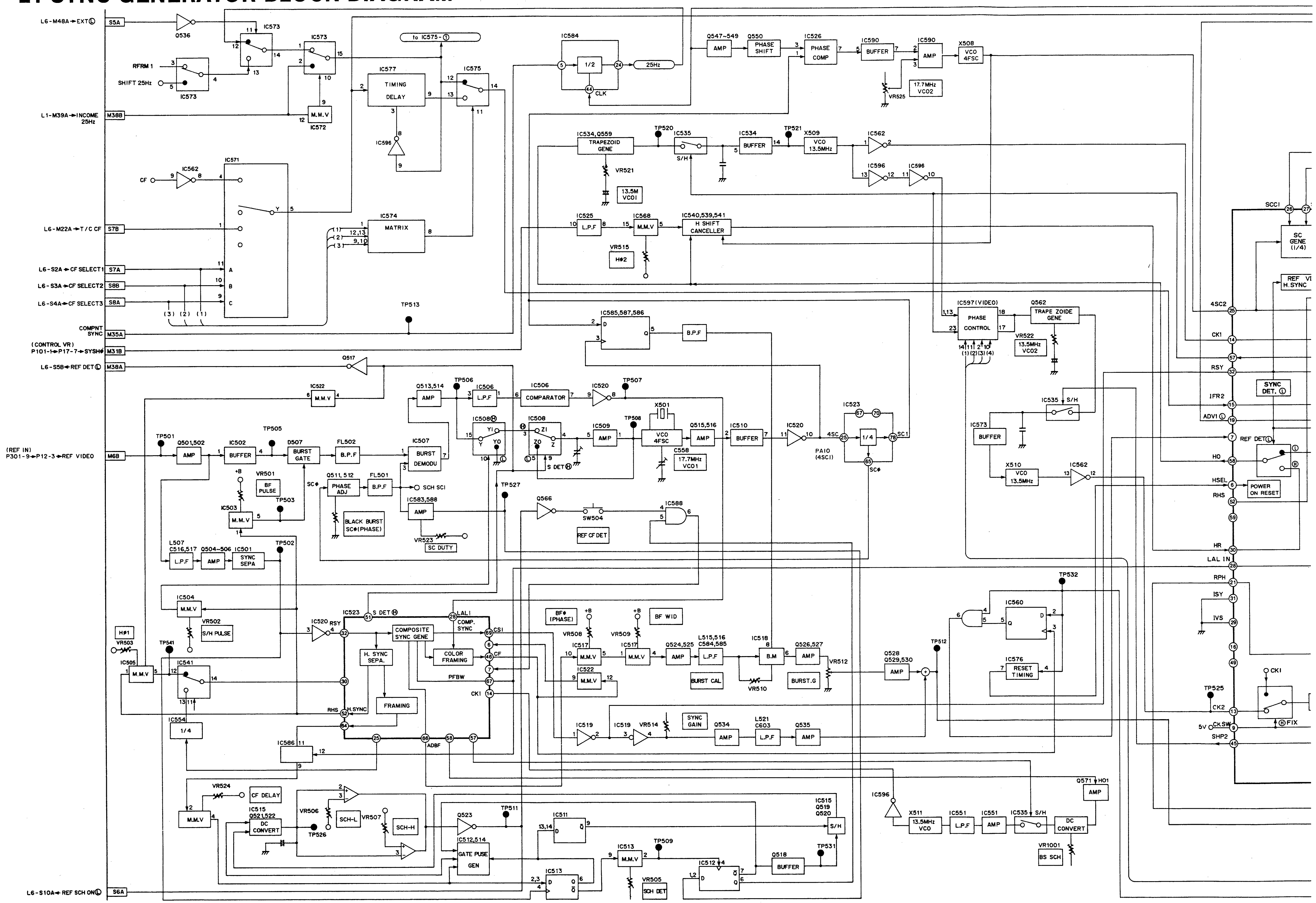


REAR PANEL

P.C. BOARD LOCATION



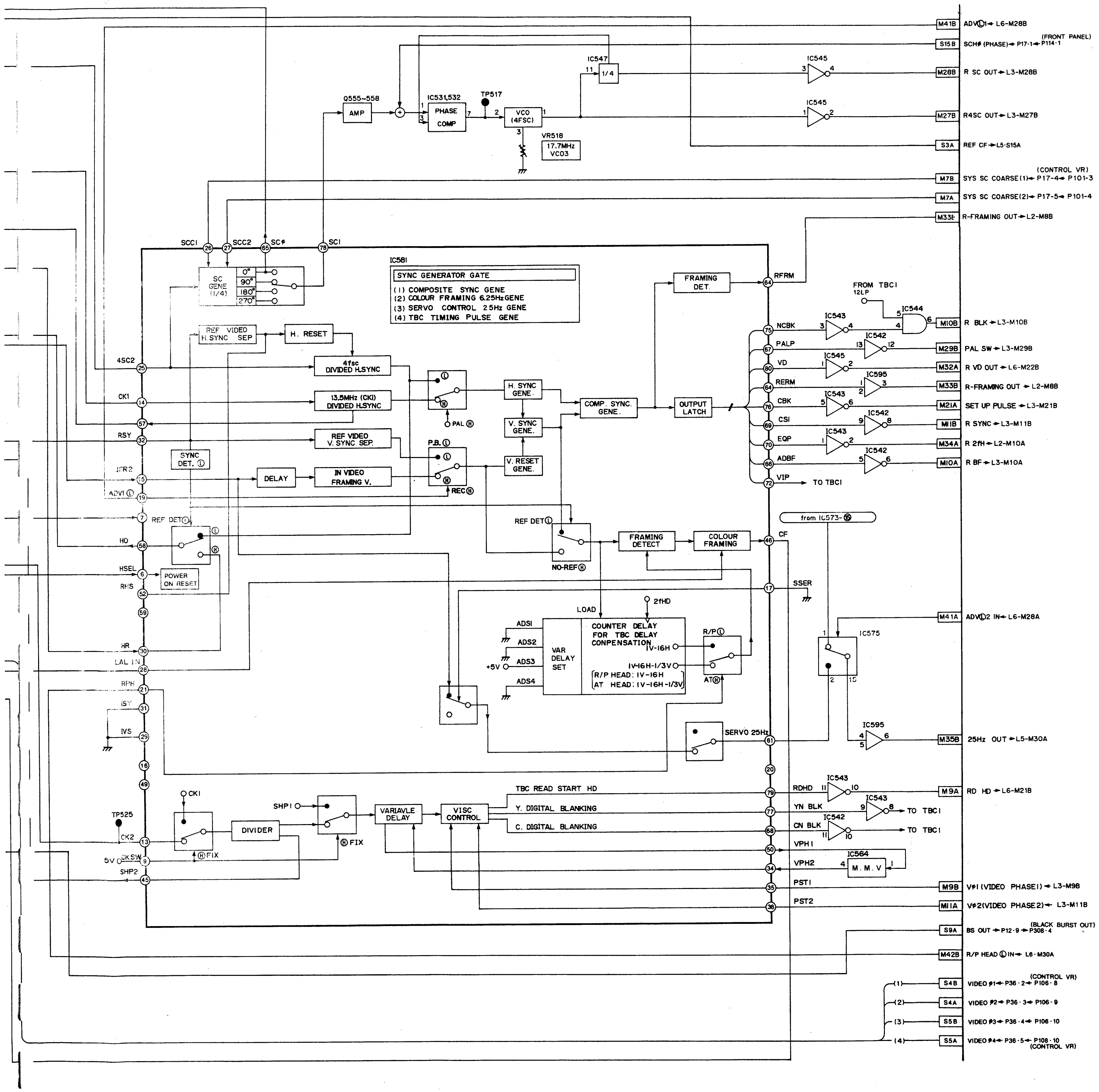
L1 SYNC GENERATOR BLOCK DIAGRAM



REVERSE SIDE

OVERALL

VQS0157



SYNC GEN GATE ARRAY PIN FUNCTION (μPD65040 G-144)

PIN NO.	PIN NAME	IN OUT	FUNCTION	PIN NO.	PIN NAME	IN OUT	FUNCTION
1	RST	IN	TEST RESET	41	RHS	OUT	REFERENCE H.SYNC
2	VDD	IN	+5V	42	VDD	IN	+5V
3	GND			43	GND		
4	MODI	IN	[0] NTSC [1] PAL	44	VSP	OUT	V SEPARATION PULSE
5	MOD2	IN	[0] NTSC [1] PAL	45	SHP2	OUT	CK2 SAMPLE & HOLD PULSE 2
6	HSEL	IN	H SYNC SELECT	46	CF	OUT	COLOR FRAMING SIGNAL
7	PFBW	IN	V-BLK SET (NTSC) COLOR FRANING CONT. (PAL)	47	SSEL	IN	HR ADJUST RANGE
				48	CS2	OUT	COMPOSITE SYNC
8	LSEL	IN	V-SYNC SELECT	49	LPF1	IN	LPF FOR FRAMING
9	CKSW	IN	VIDEO PHASE CLOCK SELECT	50	VPH1	IN	VIDEO PHASE MMV
10	TST1	IN	TEST CONTROL	51	SDET	OUT	REF SYNC DETECT
11	TST2	IN	TEST CONTROL	52	RHS	OUT	REF H SYNC W/O EQ PULSE
12	BDET	IN	BURST DETECT	53	CBU	OUT	1.6875MHz C BURST
13	CK2	IN	13.5MHz CLOCK	54	YBU	OUT	3.375MHz Y BURST
14	CK1	IN	13.5MHz CLOCK	55	CBF	OUT	C BURST FLAG
15	IFR2	IN	INCOME VIDEO FRAMING	56	YBF	OUT	Y BURST FLAG
16	LPF2	IN	LPF FOR FRAMING	57	SHP1	OUT	CK1 SAMPLE & HOLD PULSE
17	SSER	IN	SOURCE SEARCH 25Hz SELECT	58	HO	OUT	TRAPEZOIDE H PULSE
18	PINH	IN	VISC CONTROL ON/OFF	59	IFR1	OUT	IN VIDEO FRAMING
19	ADV1	IN	ADVANCE 1 FOR V_P SELECT	60	RYS	OUT	R-Y (P_R) SYNC
20	ADV2	IN	ADVANCE 2 FOR 25Hz SELECT	61	30Hz	OUT	SERVO CONTROL 25Hz
21	RPH	IN	R/P HEAD SELECT	62	GND		
22	GND			63	VDD	IN	+5V
23	VDD	IN	+5V	64	RFRM	OUT	REF FRAMING
24	TRP	IN	TRAPEZOIDE FOR PLL	65	SC0	OUT	SUB CARRIER
26	SCC1	IN	SC PHASE CONTROL	66	ADBF	OUT	ADVANCE BURST FLAG
27	SCC2	IN	SC PHASE CONTROL	67	PALP	OUT	PAL PULSE
28	LAL1	IN	COLOR FRAMING RESET	68	CNBK	OUT	CHROMA DIGITAL BLANKING
29	IVS	IN	INCOME VIDEO V SYNC	69	CS1	OUT	COMP SYNC
30	HR	IN	H.SYNC RESET	70	EQP	OUT	EQUALIZER PULSE
31	ISY	IN	IN VIDEO COMP SYNC	71	BF	OUT	BURST FLAG
32	RSY	IN	REF VIDEO COMP SYNC	72	VIP	OUT	10 LINE PULSE
33	GND			73	VP	OUT	V PULSE
34	VPH2	IN	VIDEO PHASE MMV	74	HD	OUT	HORIZONTAL DRIVE
35	PST1	IN	VISC CONTROL 90° STEP	75	NCBK	OUT	COMP BLANKING SIGNAL
36	PST2	IN	VISC CONTROL 90° STEP	76	CBK	OUT	COMP BLANKING SIGNAL
37	ADS1	IN	ADVANCE SET	77	YNBK	OUT	Y DIGITAL BLANKING
38	ADS2	IN	ADVANCE SET	78	SC1	OUT	SUB CARRIER
39	ADS3	IN	ADVANCE SET	79	RDHD	OUT	TBC READ START
40	ADS4	IN	ADVANCE SET	80	VD	OUT	VERTICAL DRIVE

L-1M	TBC 1			
B		NO	A	
		1	GND	L2M-1B
		2	GND	L2M-2B
		3	5V	L2M-3B
		4	−12V	L2M-4B
		5	−12V	L2M-5B
P12 3	REF VIDEO	6	GND	P12–4
P17 4	SYS-SC COARSE (1)	7	SYS-SC COARSE (2)	P17–5
L3M-6B	YR CLK	8	GND	L3M-6A
L3M-9B	VØ1 Ⓛ	9	RD HD	L6M-21B
L3M-10B	R BLK	10	RBF	L3M-10A
L3M-11B	R-SYNC	11	VØ2	L3M-11A
L3M-12B	Y 8	12	Y 7	L3M-12A
L3M-13B	Y 6	13	Y 5	L3M-13A
L3M-14B	Y 4	14	Y 3	L3M-14A
L3M-15B	Y 2	15	Y 1	L3M-15A
L3M-16B	GND	16	Y 9	L3M-16A
L3M-17B	PR8	17	PR7	L3M-17A
L3M-18B	PR6	18	PR5	L3M-18A
L3M-19B	PR4	19	PR3	L3M-19A
L3M-20B	PR2	20	PR1	L3M-20A
L3M-21B	Y DOP Ⓛ	21	COUNT Ⓗ	L2M-21A
L3M-22B	PB8	22	PB7	L3M-22A
L3M-23B	PB6	23	PB5	L3M-23A
L3M-24B	PB4	24	PB3	L3M-24A
L3M-25B	PB2	25	PB1	L3M-25A
L3M-26B	GND	26	GND	L3M-26A
L3M-27B	R-4SC OUT	27	GND	L3M-27A
L3M-28B	R-SC OUT	28	GND	L3M-28A
L3M-29B	PAL SW	29	12 LINE P	L3M-29A
		30	GND	
P17–7	SYS-HØ	31	SYS SC Ø	P17–8
	GND	32	R-VD OUT	L6M-22B
L2M-8B	R-FRAMING OUT	33	GND	L2M-8A
L2M-30A	PBV	34	R 2fH	L2M-10A
L5M-30A	25Hz OUT	35		
L5M-30B	GND	36	CNC ON Ⓛ	P17–6
		37		
L1M-39A	INCOME 25Hz	38	REF DET Ⓛ	L6S-5B
		39	REF 25Hz	L1M-38B
L3M-33B	GND	40		
L6M-28B	ADV Ⓛ 1 IN	41	ADV Ⓛ 2 IN	L6M-28A
L6M-30A	R/P HEAD Ⓛ IN	42	TAPE R/P Ⓛ IN	L6M-29B
L3M-40B	VISC CONT	43	GND	L3M-40A
		44	RST	L3M-7B
	–	45	+12V	L2M-45B
	–	46	+12V	L2M-46B
	–	47	+5V	L2M-47B
	–	48	+5V	L2M-48B
	–	49	GND	L2M-49B
	–	50	GND	L2M-50B

To FRONT PANEL

P4			
POWER1-1	1	+5V	P126 · 1
POWER1-1	2	+5V	P126 · 2
POWER1-1	3	+5V	P126 · 3
	4	GND	P126 · 4
	5	GND	P126 · 5
	6	GND	P126 · 6

P12			
	1		
	2		
L1M-6B	3	REV VIDEO	P301 · 9
L1M-6A	4	GND	P301 · 10
	5		
	6		
L3M-43A	7	WFM OUT	P308 · 2
L3M-43B	8	GND	P308 · 1
L1S-9A	9	BS OUT	P308 · 4
L1S-11A	10	GND	P308 · 3

To JACK

To FRONT

P17			
L1S-15B	1	SCH Ø	P114 · 1
L1S-16B	2	SCH COARSE(1)	P114 · 2
L1S-16A	3	SCH COARSE(2)	P114 · 3
L1M-7B	4	SYS-SC-COARSE (1)	P101 · 3
L1M-7A	5	SYS-SC-COARSE (2)	P101 · 4
L1M-36A	6	CNC ON Ⓛ	P114 · 5
L1M-31B	7	SYS H Ø	P101 · 1
L1M-31A	8	SYS SC Ø	P101 · 12
L2M-33A	9	YC DELAY	P134 · 5
	10	GND	P134 · 7

To FRONT

P36			
L3S-3B	1	B/W Ⓛ	P114 · 4
L1S-4B	2	VIDEO Ø1	P106 · 8
L1S-4A	3	VIDEO Ø2	P106 · 9
L1S-5B	4	VIDEO Ø3	P106 · 10
L1S-15A	5	VIDEO Ø4	P108 · 10
L3S-6B	6	BURST GAIN	P108 · 3
L3S-6A	7	SYNC GAIN	P108 · 2
L3S-7B	8	WFM D	P106 · 7
L3S-8B	9	WFM E	
L6S-24B	10	PCM ON Ⓛ	

P39			
L5M-45B	1	PCM H SW	
L5M-46B	2	PCM GATE	
	3	GND	
L6S-21A	4	PCM EE1	
L6S-22A	5	PCM EE2	
L6S-23A	6	STBY Ⓛ	
L6S-24A	7	PLAY Ⓛ	
L6M-30A	8	$\overline{\text{R/P HEAD}}$	
L6M-29B	9	$\overline{\text{TAPE R/P}}$	
L1S-10A	10	HD	
	11	GND	
L6S-25B	12	POWER ON Ⓛ	

To JACK
(PCM ONLY)

L-1S	TBC – 1			
B		NO	A	
	GND	1	GND	L2S-1A
		2		
L3M-35B	TBC CF	3	REF CF	L5S-15A
P36–2	VIDEO Ø1	4	VIDEO Ø2	P36–3
P36–4	VIDEO Ø3	5	$\overline{\text{EXT}}$	L6M-48A
		6	REF SCH	L6S-10A
L6M-22A	TC CF	7	CF SELECT 1	L6S-2A
L6S-3A	CF SELECT 2	8	CF SELECT 3	L6S 4A
L3S-9B	4LP	9	BS OUT	P12–9
	GND	10	HD	P39–10
	–	11	GND	P12–10 L2S-11B
	–	12	GND	L2S-12B
	–	13	+5V	L2S-15B
	–	14	+5V	L2S-16B
P17–1	SCH Ø	15	VIDEO Ø4	P36–5
P17–2	SCH COARSE(1)	16	SCH COARSE(2)	P17–3
	GND	17	COMON Ⓛ	L2M-29A
	GND	18	BLK ON Ⓛ	L2M-34A
		19	E-E Ⓛ	L2M-44A
L2M-43A L6M-35B	SEARCH Ⓛ	20	EJECT TAPE Ⓛ	L6M-34B
	GND	21	ADV CONT Ⓗ	L6M-36A
L2M-27A	Y DOC	22	C DOC	L2M-28A
L2S-22A	PR WZERO	23	PB WZERO	L2S-23A
	GND	24	Y WZERO	L2S-24A
L3S-25B	–	25	GND	L2S-25A
L3S-26B	C DATA 8	26	C DATA 7	L3S-26A
L3S-27B	C DATA 6	27	C DATA 5	L3S-27A
L3S-28B	C DATA 4	28	C DATA 3	L3S-28A
L3S-29B	C DATA 2	29	C DATA 1	L3S-29A
L3S-30B	–	30	GND	L3S-30A
L3S-31B	Y DATA 8	31	Y DATA 7	L3S-31A
L3S-32B	Y DATA 6	32	Y DATA 5	L3S-32A
L3S-33B	Y DATA 4	33	Y DATA 3	L3S-33A
L3S-34B	Y DATA 2	34	Y DATA 1	L3S-34A
L2S-35B	Y WCK	35	Y DATA 9	L3S-35A
L2S-36B	GND	36	C WCK	L2S-36A
POWER1–1	–	37	+5V	L2S-38B
POWER1–2	–	38	+5V	L2S-38B
	–	39	GND	L2S-39B
	–	40	GND	L2S-40B

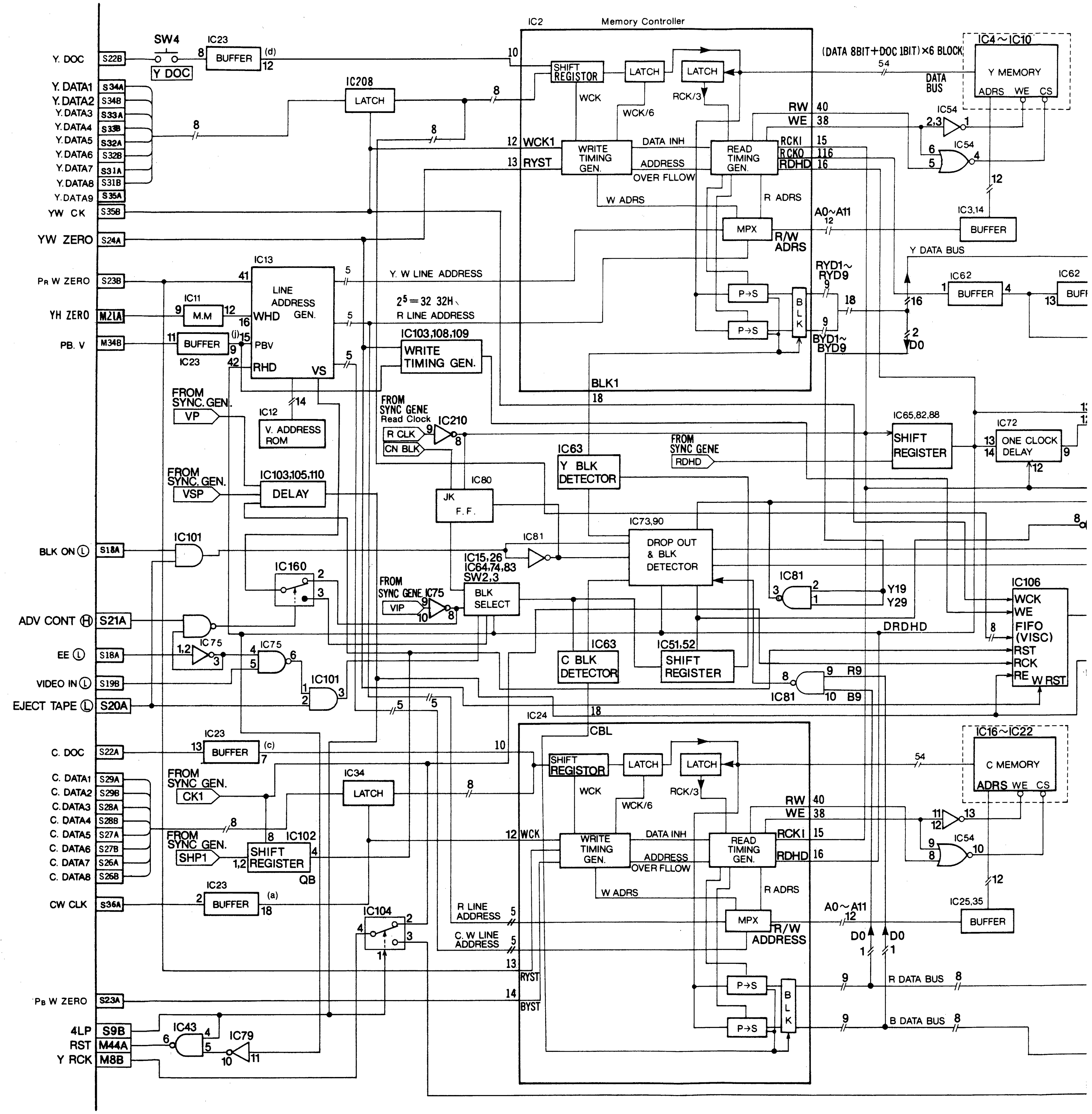
POWER 1			
L1S–37B POWER2-7	1	+5V	P214-7
L1S–38B POWER2-7	2	+5V	P214-6
	3	GND	P214-5
	4	GND	P214-4
	5	GND	P214-3

To POWER BOX

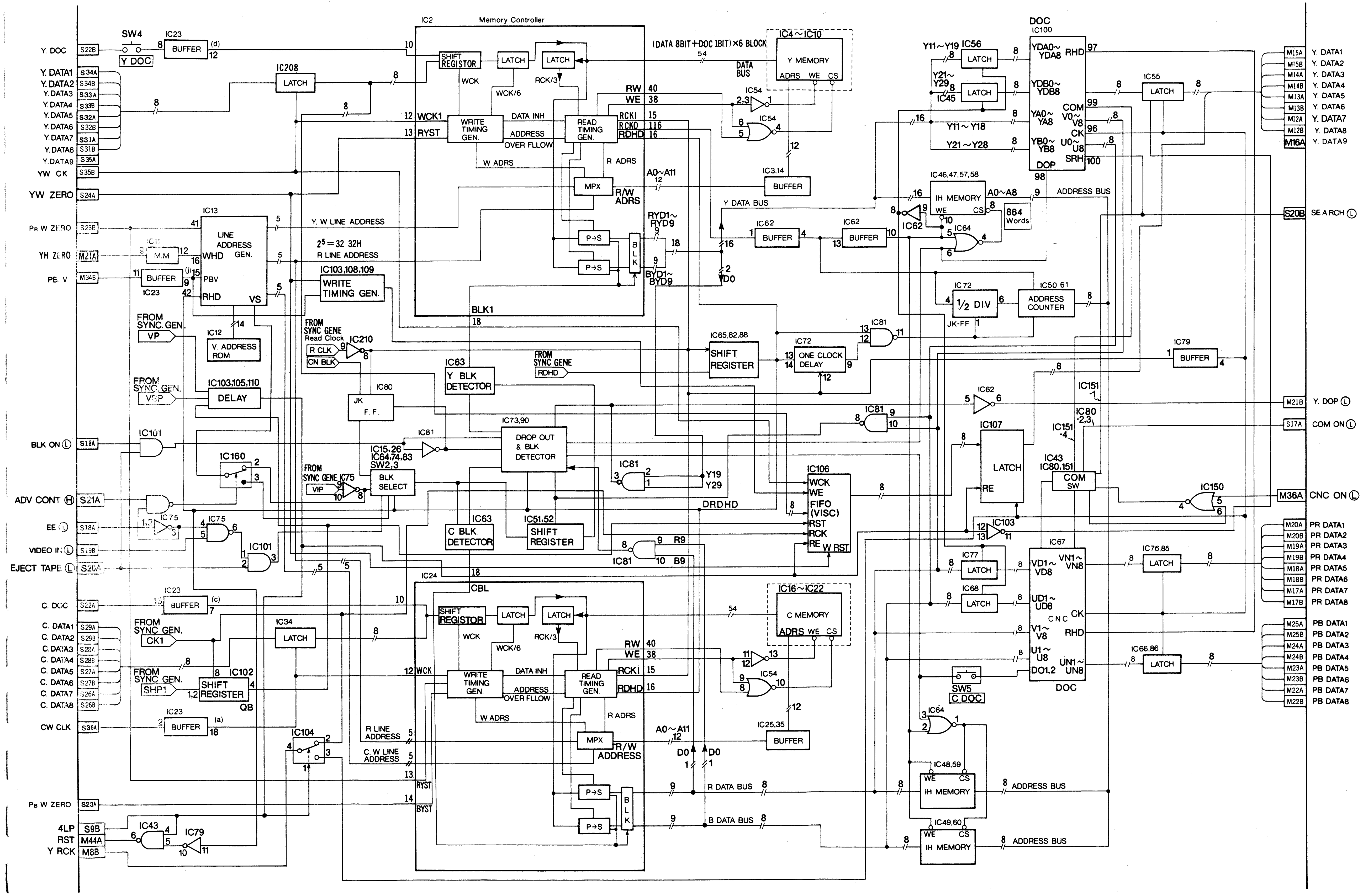
P11			
	1	+5V	P215 · 1
	2	GND	—
	3	GND	P215 · 2

To POWER BOX

L1 TBC 1 BLOCK DIAGRAM

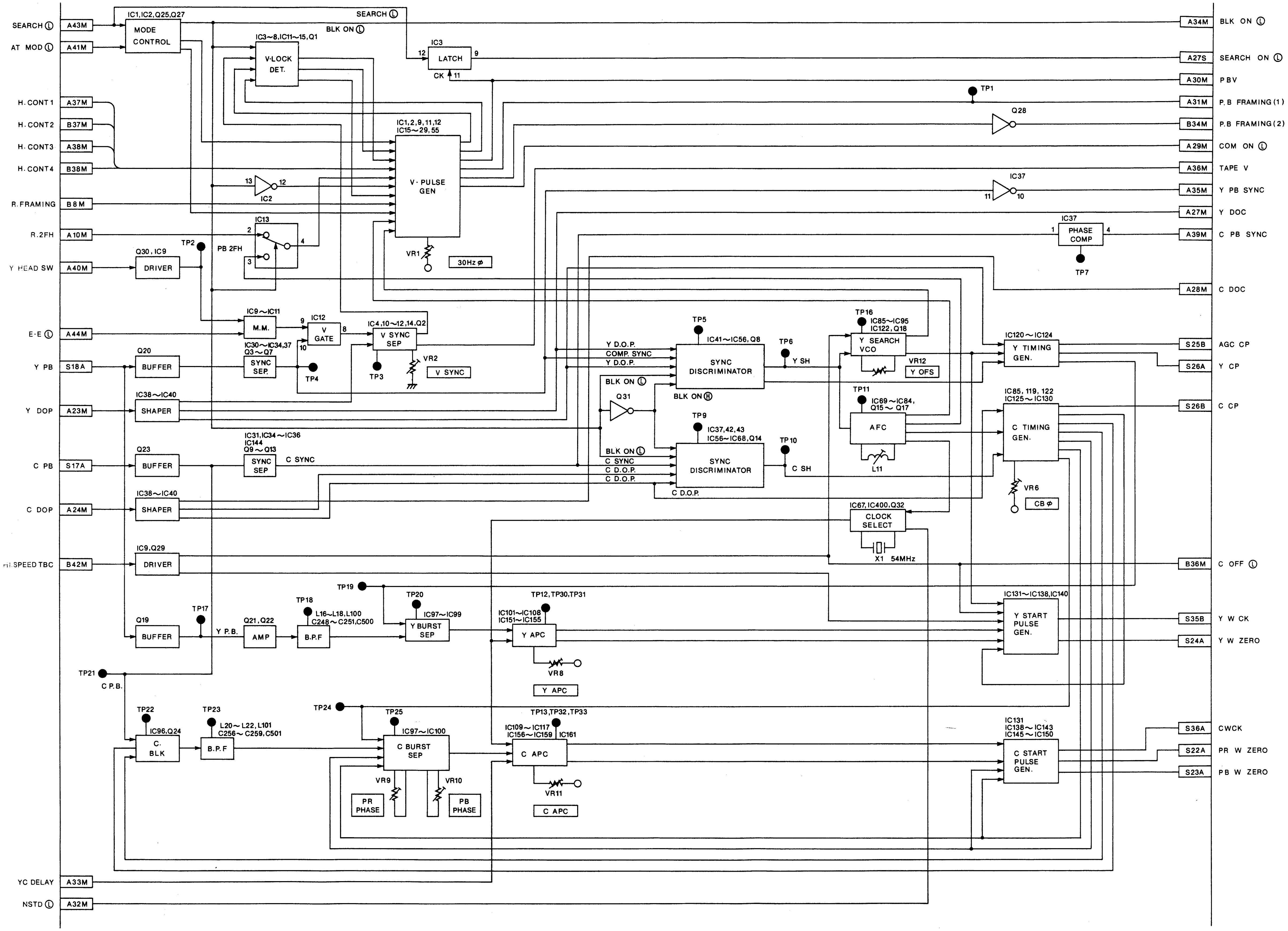


.1 TBC 1 BLOCK DIAGRAM



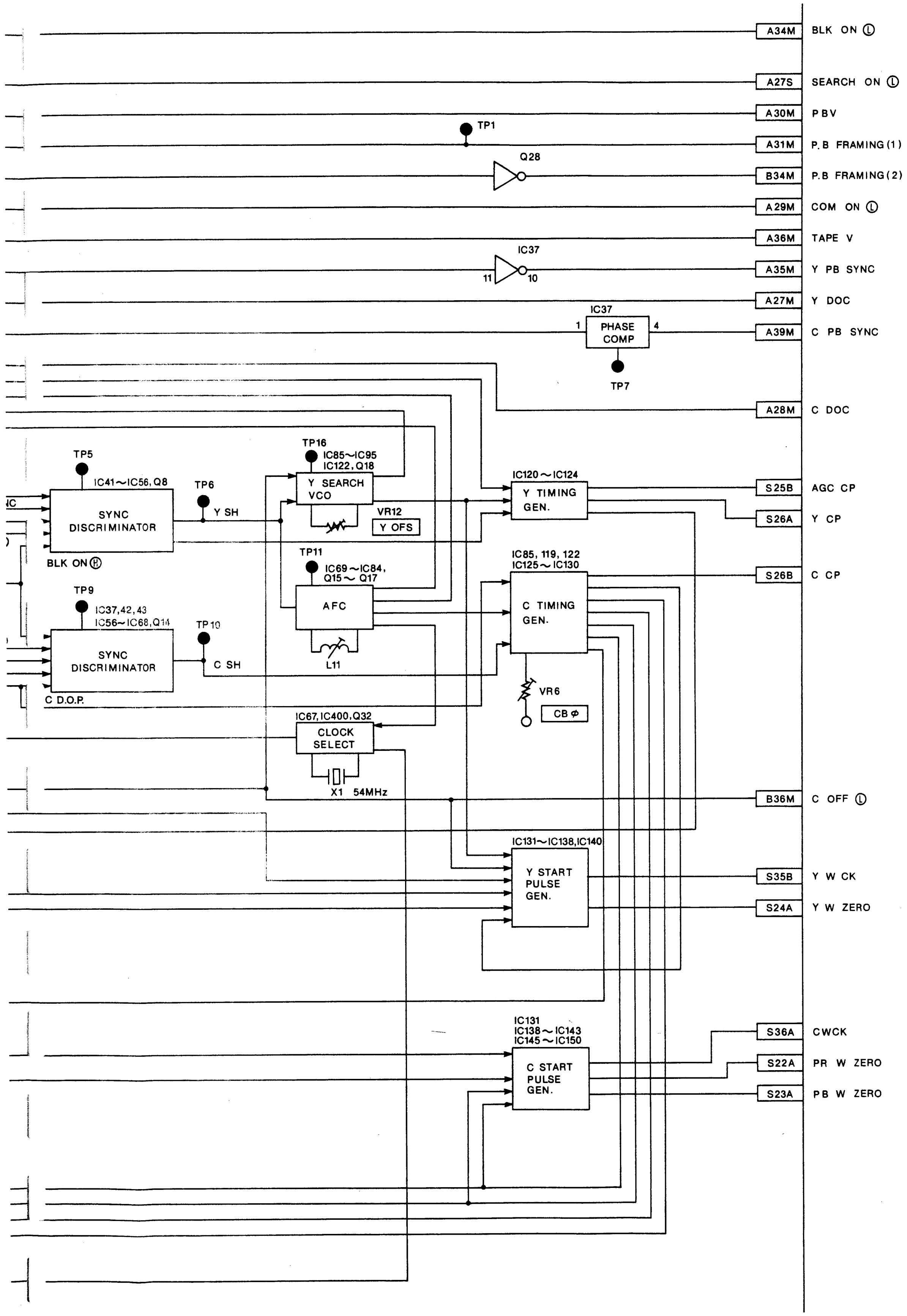
REVERSE SIDE
L2 TBC 2

L2 TBC 2 BLOCK DIAGRAM



L-2M	TBC – 2			
B		NO	A	
L1M-1A	–	1	GND	L3M-1B
L1M-2A	–	2	GND	L3M-2B
L1M-3A	–	3	5V	L3M-3B
L1M-4A	–	4	12V	L3M-4B
L1M-5A	–	5	12V	L3M-5B
		6		
		7		
L1M-33B L6M29A	R FRAMING	8	GND	L1M-33
	GND	9		
	GND	10	R2fH	L1M-34
	GND	11		
	GND	12		
	GND	13		
	GND	14		
	GND	15		
	GND	16		
	GND	17		
	GND	18		
	GND	19		
	GND	20		
	GND	21	COUNT Ⓗ	L1M-21
	GND	22		
P26–2	GND	23	Y DOP	P26–1
P26–4	GND	24	C DOP	P26–3
		25		
		26		
	GND	27	Y DOC	L1S-22
	GND	28	C DOC	L1S-22
	GND	29	COMON Ⓛ	L1S-17
	GND	30	PBV	L1M-34
L5M-31B	GND	31	PB FRAMING (1)	L5M-31
	GND	32	N-STD	L6M-36
P26-8	GND	33	YC DELAY	P17–9
P26-7	PB FRAMING (2)	34	BLK ON Ⓛ	L1S-18
P26–10 L5M-29B	GND	35	Y PB SYNC	P26–9
L3M-36B	C OFF Ⓛ	36	TAPE V	L6M-18
P34-2	H CONT 2	37	H CONT 1	P34-1
P34-4	H CONT 4	38	H CONT 3	P34-3
P26–12	GND	39	C PB SYNC	P26–11
L5M-14B	GND	40	Y HEAD SW	L5M-12
	GND	41	AT MODE Ⓛ	L6M-33
L6M-34A	HI SPEED TBC	42		
	GND	43	SEARCH Ⓛ	L1S-20
	GND	44	EE Ⓛ	L1S-19A
L1M-45A	–	45	+12V	L3M-4
L1M-46A	–	46	+12V	L3M-4
L1M-47A	–	47	+5V	L3M-4
L1M-48A	–	48	+5V	L3M-4
L1M-49A	–	49	GND	L3M-4
L1M-50A	–	50	GND	L3M-5

L-2S	TBC – 2			
B		NO	A	
L1S-1A	GND	1	GND	L3S-1
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
L1S-11A	–	11	GND	L3S-1
L1S-12A	–	12	GND	L3S-1
	–	13	–5V	L3S-1
	–	14	–12V	L3S-1
L1S-13A	–	15	+5V	L3S-3
L1S-14A	–	16	+5V	L3S-3
L3S-1A	GND	17	C PB	L3S-2
L3S-1A	GND	18	Y PB	L3S-3
		19		
		20		
	GND	21		
	GND	22	PR WZERO	L1S-2
	GND	23	PB WZERO	L1S-2
	GND	24	Y WZERO	L1S-2
L3S-23B P26-5	AGC CP	25	GND	L1S-2
L3S-24B P26-6	C CP	26	Y CP	L3S-2
	GND	27	SEARCH ON Ⓛ	L3S-2
	GND	28		
	GND	29		
	GND	30		
		31		
		32		
		33		
		34		
L1S-35B L3S35B	YWCK	35	GND	
L1S-36B L3S36B	GND	36	C WCK	L1S-36
	–	37	+12V	L3S-3
L1S-37A, 38A	–	38	+5V	L3S-3
L1S-39A	–	39	GND	L3S-3
L1S-40A	–	40	GND	L3S-4



L-2M	TBC – 2			
B		NO	A	
L1M-1A	–	1	GND	L3M-1B
L1M-2A	–	2	GND	L3M-2B
L1M-3A	–	3	-5V	L3M-3B
L1M-4A	–	4	12V	L3M-4B
L1M-5A	–	5	12V	L3M-5B
		6		
		7		
L1M-33B L6M29A	R FRAMING	8	GND	L1M-33A
	GND	9		
	GND	10	R2fH	L1M-34A
	GND	11		
	GND	12		
	GND	13		
	GND	14		
	GND	15		
	GND	16		
	GND	17		
	GND	18		
	GND	19		
	GND	20		
	GND	21	COUNT Ⓗ	L1M-21A
	GND	22		
P26-2	GND	23	Y DOP	P26-1 L6M32B
P26-4	GND	24	C DOP	P26-3 L6M-32A
		25		
		26		
	GND	27	Y DOC	L1S-22B
	GND	28	C DOC	L1S-22A
	GND	29	COMON Ⓛ	L1S-17A
	GND	30	PBV	L1M-34B
L5M-31B	GND	31	PB FRAMING (1)	L5M-31A
	GND	32	N·STD	L6M-36B
P26-8	GND	33	YC DELAY	P17-9
P26-7	PB FRAMING (2)	34	BLK ON Ⓛ	L1S-18A
P26-10 L5M-29B	GND	35	Y PB SYNC	P26-9 L5M-29A
L3M-36B	C OFF Ⓛ	36	TAPE V	L6M-18B
P34-2	H CONT 2	37	H CONT 1	P34-1
P34-4	H CONT 4	38	H CONT 3	P34-3
P26-12	GND	39	C PB SYNC	P26-11
L5M-14B	GND	40	Y HEAD SW	L5M-12B
	GND	41	AT MODE Ⓛ	L6M-33A
L6M-34A	HI SPEED TBC	42		
	GND	43	SEARCH Ⓛ	L1S-20B
	GND	44	EE Ⓛ	L1S-19A L3S-9A
L1M-45A	–	45	+12V	L3M-45B
L1M-46A	–	46	+12V	L3M-46B
L1M-47A	–	47	+5V	L3M-47B
L1M-48A	–	48	+5V	L3M-48B
L1M-49A	–	49	GND	L3M-49B
L1M-50A	–	50	GND	L3M-50B

L-2S	TBC – 2			
B		NO	A	
L1S-1A	GND	1	GND	L3S-1B
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
L1S-11A	–	11	GND	L3S-11B
L1S-12A	–	12	GND	L3S-12B
	–	13	-5V	L3S-13B
	–	14	-12V	L3S-14B
L1S-13A	–	15	+5V	L3S-38B
L1S-14A	–	16	+5V	L3S-38B
L3S-1A	GND	17	C PB	L3S-2A
L3S-1A	GND	18	Y PB	L3S-3A
		19		
		20		
	GND	21		
	GND	22	PR WZERO	L1S-23B
	GND	23	PB WZERO	L1S-23A
	GND	24	Y WZERO	L1S-24A
L3S-23B P26-5	AGC CP	25	GND	L1S-25A
L3S-24B P26-6	C CP	26	Y CP	L3S-24A
	GND	27	SEARCH ON Ⓛ	L3S-23A
	GND	28		
	GND	29		
	GND	30		
		31		
		32		
		33		
		34		
L1S-35B L3S-35B	YWCK	35	GND	
L1S-36B L3S-36B	GND	36	C WCK	L1S-36A L3S-36A
	–	37	+12V	L3S-37B
L1S-37A, 38A	–	38	+5V	L3S-38B
L1S-39A	–	39	GND	L3S-39B
L1S-40A	–	40	GND	L3S-40B

To FRONT

P17			
L1S-15B	1	SCH ϕ	P114-1
L1S-16B	2	SCH COARSE(1)	P114-2
L1S-16A	3	SCH COARSE(2)	P114-3
L1M-7B	4	SYS.SC COARSE (1)	P101-3
L1M-7A	5	SYS.SC COARSE (2)	P101-4
L1M-36A	6	CNC ON Ⓛ	P114-5
L1M-31B	7	SYS H ϕ	P101-1
L1M-31A	8	SYS SC ϕ	P101-12
L2M-33A	9	YC DELAY	P134-5
	10	GND	P134-7

To S∅

P26			
L2M-23A	1	Y DOP	P57-3
L2M-23B	2	GND	P57-4
L2M-24A	3	C DOP	P57-1
L2M-24B	4	GND	P57-2
L2S-25B	5	Y AGC CP	P78-8
L2S-26B	6	C CP	P78-9
L2M-34B	7	PB FRAMING(2)	P64-8
L2M-33B	8	GND	
L2M-35A	9	Y PB SYNC	P64-10
L2M-35B	10	GND	P64-9
L2M-39A	11	C PB SYNC	P64-12
L2M-39B	12	GND	P64-11

To S0

P34			
L2M-37A	1	H CONT 1	P77-1
L2M-37B	2	H CONT 2	P77-2
L2M-38A	3	H CONT 3	P77-3
L2M-38B	4	H CONT 4	P77-4

L-3M	ENCODER			
B		NO	A	
L2M-1A	–	1	GND	
L2M-2A	–	2	GND	
L2M-3A	–	3	-5V	
L2M-4A	–	4	-12V	L5M-4B
L2M-5A	–	5	-12V	L5M-4B
L1M-8B	YR CLK	6	GND	L1M-8A
L1M-44A	RST	7	WFM A	P16-8
P16-10	WFM C	8	WFM B	P16-9
L1M-9B L6M27B	VB1 Ⓛ	9		
L1M-10B	R BLK	10	R BF	L1M-10A
L1M-11B	R SYNC	11	VB2	L1M-11A
L1M-12B	Y DATA 8	12	Y DATA 7	L1M-12A
L1M-13B	Y DATA 6	13	Y DATA 5	L1M-13A
L1M-14B	Y DATA 4	14	Y DATA 3	L1M-14A
L1M-15B	Y DATA 2	15	Y DATA 1	L1M-15A
L1M-16B	GND	16	Y DATA 9	L1M-16A
L1M-17B	PR DATA 8	17	PR DATA 7	L1M-17A
L1M-18B	PR DATA 6	18	PR DATA 5	L1M-18A
L1M-19B	PR DATA 4	19	PR DATA 3	L1M-19A
L1M-20B	PR DATA 2	20	PR DATA 1	L1M-20A
L1M-21B	Y DOP Ⓛ	21		
L1M-22B	PB DATA 8	22	PB DATA 7	L1M-22A
L1M-23B	PB DATA 6	23	PB DATA 5	L1M-23A
L1M-24B	PB DATA 4	24	PB DATA 3	L1M-24A
L1M-25B	PB DATA 2	25	PB DATA 1	L1M-25A
L1M-26B	–	26	GND	L1M-26A
L1M-27B	R 4fSC	27	GND	L1M-27A
L1M-28B	R SC	28	GND	L1M-28A
L1M-29B	PAL SW	29	12 LINE P	L1M-29A
P16-1	SET UP	30	HUE	P16-2
P16-3	VIDEO GAIN	31	Y GAIN	P16-4
P16-5	PR GAIN	32	PB GAIN	P16-6
L1M-40B	GND	33	C GAIN	P16-7
	GND	34	CHARACTER IN	L6M-15A
L1S-3B	TBC CF	35	CHARACTER GATE	L6M-16A
L2S-36B	C OFF Ⓛ	36	REV SEARCH Ⓛ	L5S-30B
P18-2	GND	37	WFM Y RF	P18-1
P18-4	GND	38	WFM C RF	P18-3
		39		
L1M-43B	VISC CONT	40	GND	L1M-43A
L6S-20A	VB CF Ⓛ	41	PHASE INH	L6M-35A
	GND	42	ID OFF Ⓛ	L6S-8B
P12-8	GND	43	WFM OUT	P12-7
		44		
L2M-45A	–	45	+12V	L5M-48B
L2M-46A	–	46	+12V	L5M-48B
L2M-47A	–	47	+5V	L4S-38B
L2M-48A	–	48	+5V	L4S-38B
L2M-49A	–	49	GND	
L2M-50A	–	50	GND	

L-3S	ENCODER			
B		NO	A	
L2S-1A	GND	1	GND	L2S-17B, 18B
P25-1, 3	GND	2	C PB	L2S-17A P25-2
P36-1	B/W Ⓛ	3	Y PB	L2S-18A P25-4
P37-3	SMPTE PB	4	SMPTE Y	P37-1
P37-5	SMPTE PR	5	GND	P37-2, 4, 6
P36-6	BURST GAIN	6	SYNC GAIN	P36-7
P36-8	WFM D	7		
P36-9	WFM E	8		
L1S-9B	4LP	9	EE Ⓛ	L5M-18B L2M-44A
		10	SERVO LOCK	L5M-33B
L2S-11A	–	11	GND	
L2S-12A	–	12	GND	
L2S-13A	–	13	-5V	POWER2-2 L6S36B
L2S-14A	–	14	-12V	L5S-35B
P7-2	GND	15	VIDEO 1 OUT	P7-1
P7-4	GND	16	VIDEO 2 OUT	P7-3
P7-6	GND	17	VIDEO 3 OUT	P7-5
P7-8	GND	18	Y OUT	P7-7
P7-10	GND	19	PR OUT	P7-9
P7-12	GND	20	PB OUT	P7-11
P46-2	GND	21	PB PCM Y2	P46-1
P46-4	GND	22	PB PCM C2	P46-3
L2S-25B	Y AGC CP	23	SEARCH ON Ⓛ	L2S-27A
L2S-26B	C CP	24	Y CP	L2S-26A
L1S-25B	GND	25		
L1S-26B	C DATA 8	26	C DATA 7	L1S-26A
L1S-27B	C DATA 6	27	C DATA 5	L1S-27A
L1S-28B	C DATA 4	28	C DATA 3	L1S-28A
L1S-29B	C DATA 2	29	C DATA 1	L1S-29A
L1S-30B		30	GND	L1S-30A
L1S-31B	Y DATA 8	31	Y DATA 7	L1S-31A
L1S-32B	Y DATA 6	32	Y DATA 5	L1S-32A
L1S-33B	Y DATA 4	33	Y DATA 3	L1S-33A
L1S-34B	Y DATA 2	34	Y DATA 1	L1S-34A
L2S-35B	Y WCK	35	Y DATA 9	L1S-35A
L2S-36B	GND	36	CWCK	L2S-36A
L2S-37A	–	37	+12V	L5S-26B
L2S-15A, 16A, 38A	–	38	+5V	L5S-38B
L2S-39A	–	39	GND	
L2S-40A	–	40	GND	

P7			
L3S-15A	1	VIDEO 1 OUT	P308-10
L3S-15B	2	GND	P308-9
L3S-16A	3	VIDEO 2 OUT	P308-8
L3S-16B	4	GND	P308-7
L3S-17A	5	VIDEO 3 OUT	P308-6
L3S-17B	6	GND	P308-5
L3S-18A	7	Y OUT	P306-1
L3S-18B	8	GND	P306-2
L3S-19A	9	PR OUT	P306-3
L3S-19B	10	GND	P306-4
L3S-20A	11	PB OUT	P306-5
L3S-20B	12	GND	P306-6

To JACK

P12			
	1		
	2		
L1M-6B	3	REV VIDEO	P301-9
L1M-6A	4	GND	P301-10
	5		
	6		
L3M-43A	7	WFM OUT	P308-2
L3M-43B	8	GND	P308-1
L1S-9A	9	BS OUT	P308-4
L1S-11A	10	GND	P308-3

To JACK

To FRONT

P16			
L3M-30B	1	SET UP	P101-8
L3M-30A	2	HUE	P101-9
L3M-31B	3	VIDEO GAIN	P101-6
L3M-31A	4	Y GAIN	P108-4
L3M-32B	5	PR GAIN	P108-6
L3M-32A	6	PB GAIN	P108-5
L3M-33A	7	C GAIN	P101-7
L3M-7A	8	WFM A	P106-1
L3M-8A	9	WFM B	P106-2
L3M-8B	10	WFM C	P106-3

To S∅

P18			
L3M-37A	1	WFM Y RF	P57-8
L3M-37B	2	GND	P57-7
L3M-38A	3	WFM C RF	P57-6
L3M-38B	4	GND	P57-5

To S∅

P25			
L3S-2B	1	GND	P59-5
L3S-2A	2	C PB	P59-6
L3S-2B L6M-26A	3	GND	P59-7
L3S-3A L6M-26B	4	Y PB	P59-8
	5		
L6S-23B	6	PCM DET	P62-8

To FRONT

P36			
L3S-3B	1	B/W Ⓛ	P114-4
L1S-4B	2	VIDEO ♯1	P106-8
L1S-4A	3	VIDEO ♯2	P106-9
L1S-5B	4	VIDEO ♯3	P106-10
L1S-15A	5	VIDEO ♯4	P108-10
L3S-6B	6	BURST GAIN	P108-3
L3S-6A	7	SYNC GAIN	P108-2
L3S-7B	8	WFM D	P108-7
L3S-8B	9	WFM E	
L6S-24B	10	PCM ON Ⓛ	

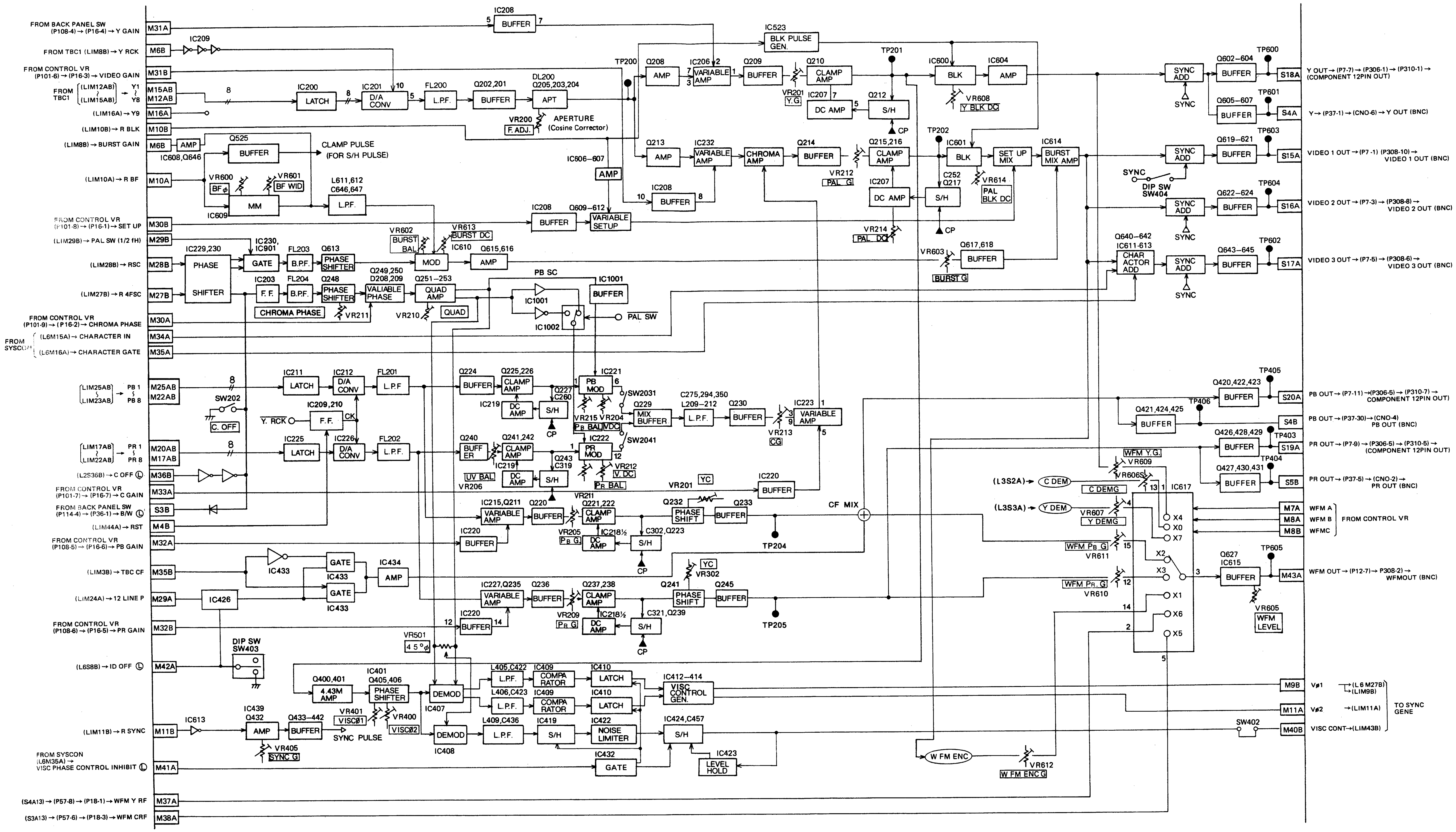
P37			
L3S-4A	1	SMPTE Y	CNO-6
L3S-5A	2	GND	CNO-5
L3S-4B	3	SMPTE PB	CNO-4
L3S-5A	4	GND	CNO-3
L3S-5B	5	SMPTE PR	CNO-2
L3S-5A	6	GND	CNO-1

To JACK

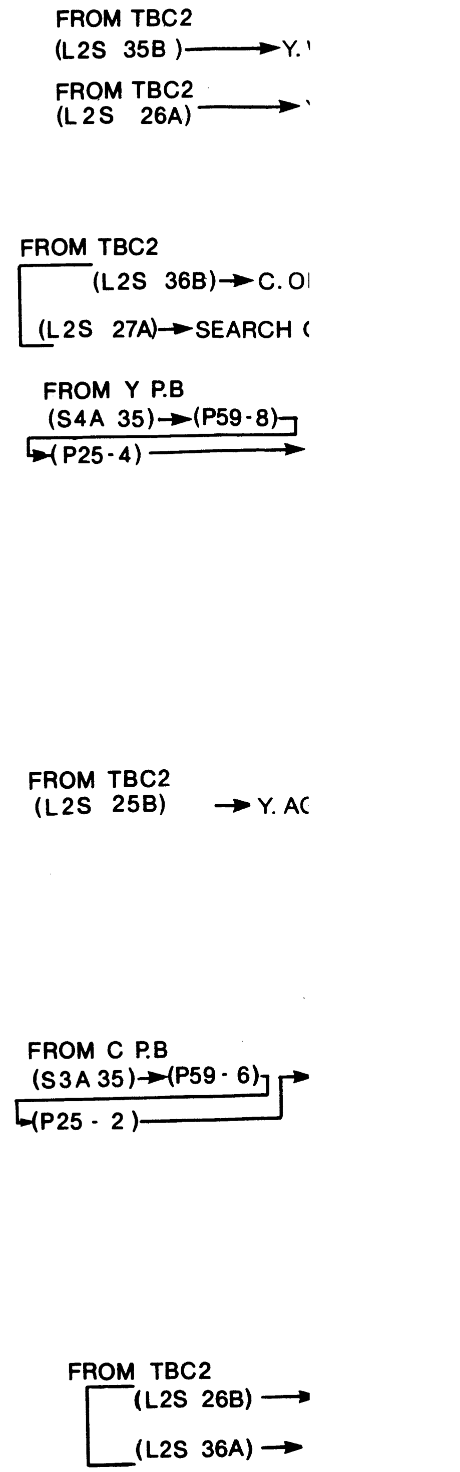
To S∅

POWER 2			
L5S-35A	1	-12V	POWER5-1
L3S-13A	2	-5V	POWER5-2
—	3	GND	POWER5-3
—	4	GND	POWER5-4
—	5	+12V Ⓛ	POWER5-5
—	6		POWER5-6
POWER1 1.2 L5M-3A L5S-37A	7	+5V	POWER5-7

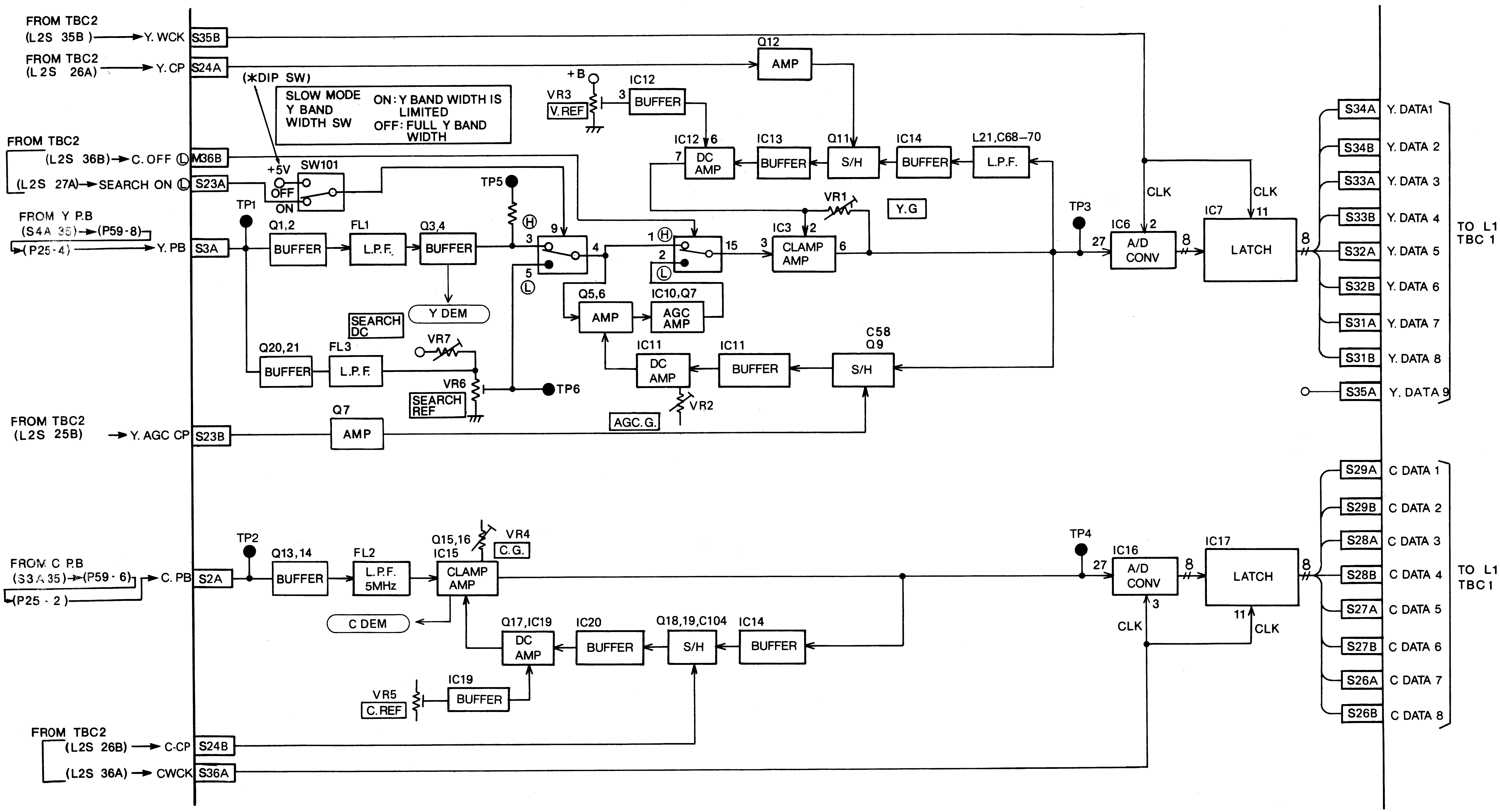
L3 ENCODER BLOCK DIAGRAM (1/2)



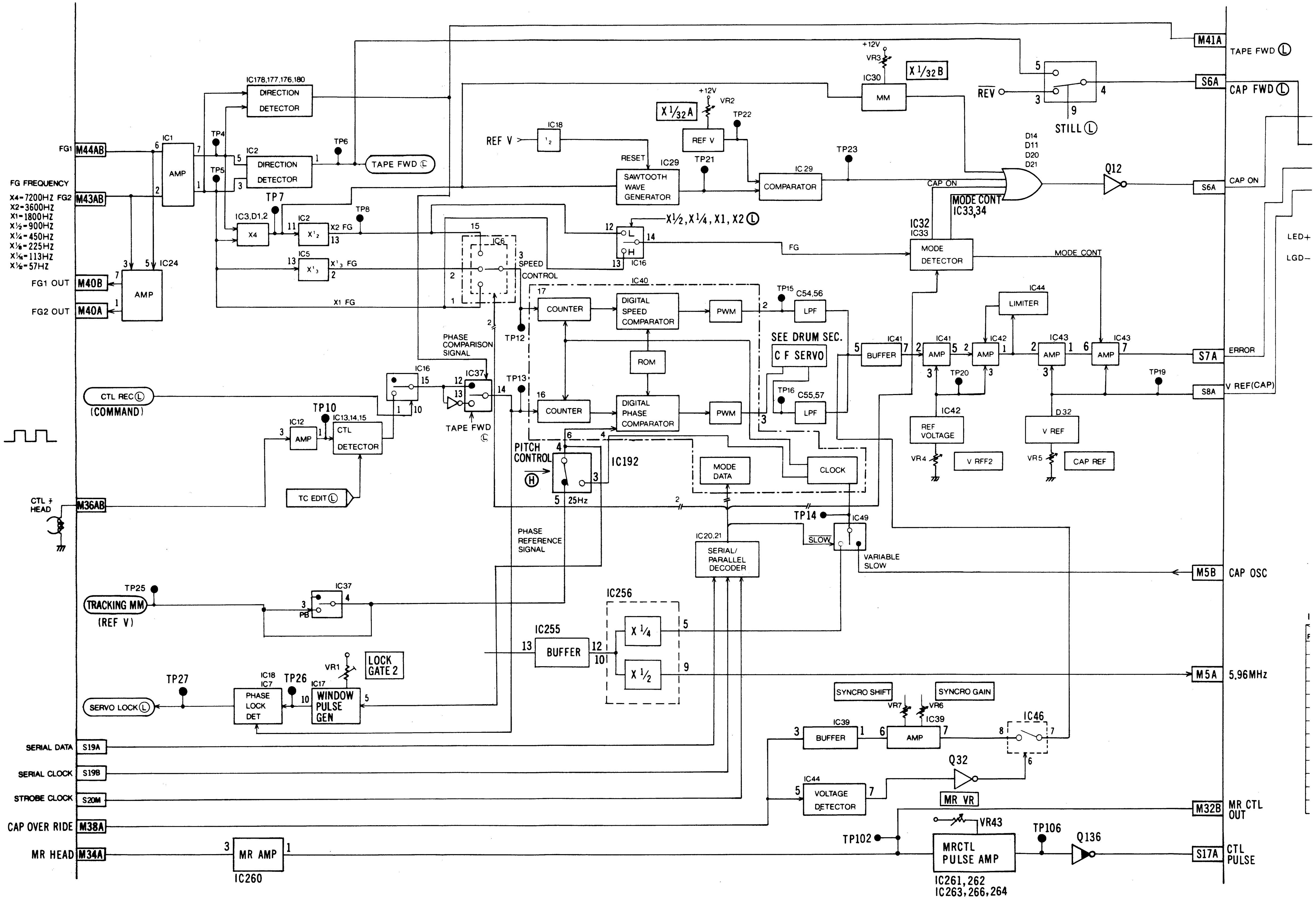
L3 ENCODER B



L3 ENCODER BLOCK DIAGRAM (2/2)

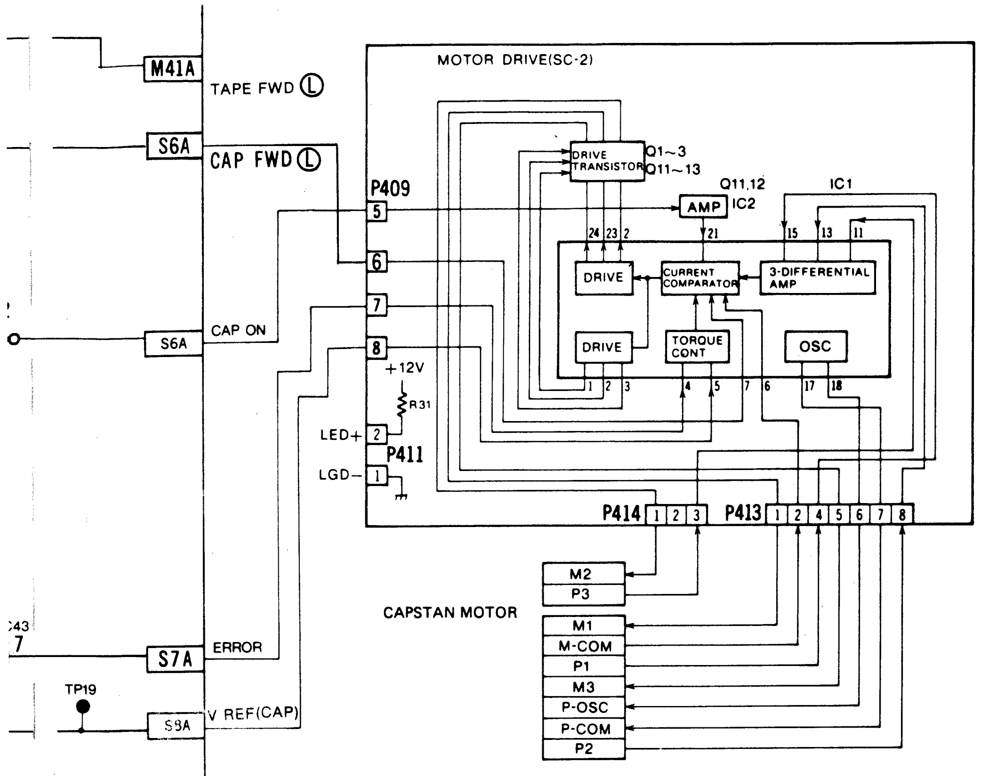


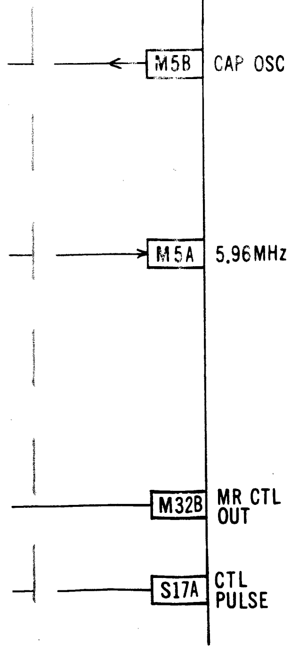
L5 CAPSTAN SERVO BLOCK DIAGRAM



REVERSE SIDE

L3 ENCODER (1/2), (2/2)





IC 40 MODE SELECT (M=2.5V)

PIN \ MODE	X4	X2	X1	X½	X¼	X⅛	X1/16	X1/32	STILL
7	H	H	H	H	H	H	H	H	L
8	L	L	L	L	L	L	L	L	L
9	L	L	L	L	L	L	L	L	L
10	H	H	H	L	L	L	L	L	H/L
11	H	H	H	L	H	H	H	H	H/L
12	M	M	M	M	M	M	M	M	M
13	L	L	L	L	L	L	H	H	L
17	2400Hz	1200Hz	600Hz	900Hz	450Hz	225Hz	113Hz	57Hz	0
19	L	L	L	L	L	L	L	L	L
20	H	L	L	L	L	L	L	L	L
21	L	H	L	L	L	L	L	L	L
22	L	L	H	H	H	H	H	H	H/L
23	L	L	L	L	L	L	L	L	L

L-6M		SERVO & REEL		
B		NO	A	
	−	1	GND	
	−	2	GND	
	−	3	+5V	POWER2−7
L3M-4A, 5A	−	4	−12V	
L6M-43B	CAP OSC	5	5.96MHz	L6M-43A
		6		
		7		
	−	8	GND	
		9	Y R/P H SW	L6S-21B
		10		
P14-2	−	11	GND	P14-6
L2M-40A, P14-1	Y H SW	12	AT REF H SW	P14−5
P14-3	C H SW	13		
P14-4	GND	14		
	GND	15		
		16		
		17		
L3S-9A	EE	18		
P27-5	GND	19		
		20		
	−	21	PG	P10−1
	−	22	(GND)	P10−2
	−	23	FG	P10−3
	−	24	(GND)	P10−4
		25	TIMER OUT	P23-7, P19-4
		26	+B	P10−5
		27		
		28		
L2M-35B	GND	29	PB SYNC	L2M-35A, L6M-19B
L1M-36B	GND	30	25Hz	L1M-35B
L2M-31B	GND	31	PB FRAMING (1)	L2M-31A
P28−1	CTL OUT	32	DRUM LOCK	L6M-41A
L3S-10A, L6M-40B	SERVO LOCK	33	DRUM SERVO	P35-1
CN11−2	(GND)	34	MR HEAD	CN11-1
	−	35	CTL HEAD (−)	CN12−2
	−	36	CTL HEAD (+)	CN12-1
P23−9	TR VR (+)	37	GND	L6S-32A
P23−10	TR VR (−)	38	CAP OVERRIDE	L6S-31A
	−	39	GND	P22-2
P22-1	FG1 OUT	40	FG 2 OUT	P22−6
P22-3	GND	41	TAPE FWD	L6S-16A
	−	42	FG COM	P30−1
	−	43	FG 2	P30−2
	−	44	FG 1	P30−3
P39−1	PCM H SW	45	FIELD SELECT 1	L6S-6B
P39−2	PCM GATE	46	FIELD SELECT 2	L6S-7B
L6S-22B	PCM ERASE	47	FIELD SELECT 3	L6S-10B
L3M-45A, 46A	−	48	+12V	
	−	49	GND	
	−	50	GND	

L-5S		SERVO & REEL		
B		NO	A	
P43−1	REEL ON (M)	1	CYL ON	P42−1
P43−2	S DRIVE CONT	2	V REF (DRUM)	P42−2
P43−3	GND	3	ERROR (DRUM)	P42−3
P43−4	T DRIVE CONT	4	GND	P42−4
P43−5	GND	5	CAP ON	P42−5
P43−6	S BRAKE (H)	6	CAP FWD	P42−6
P43−7	T BRAKE (H)	7	ERROR (CAP)	P42−7
P43−8	L CASSET	8	V REF (CAP)	P42−8
		9	GND	P42−9
		10		
	GND	11	GND	
		12		
		13		
		14		
		15	REF CF	L1S-3A
L6S-3B	CF LOCK (L)	16	GND	L6M-50A
L6S-4B	CF MODE (L)	17	CTL PULSE	L6M-49A
L6S-25A	F (L)	18	AUTO/FORCED	L6S-1A
P5−2, L6S-17A	SERIAL CK	19	SERIAL DATA (C)	L6S-17B
P5−3, L6S-18A	STRB CK	20	SERIAL DATA (R)	L6S-18B
		21	SERIAL DATA (T)	L6S-16B
L6S-13B	REF 25/2Hz	22	REF 25/4Hz	L6S-13A
L6S-14A	TR FG 1	23	TR FG 2	L6S-15A
L6M-46A	TAPE SLACK	24		
P13−1	TR PH 1	25	TR PH 2	P13−2
P13−3	S TENSION Va	26	T TENSION Va	P13−6
P13−4	S TENSION	27	T TENSION	P13−7
P13−5	S TENSION GND	28	T TENSION GND	P13−8
		29		
P35-3, L3M-38A	REV SEARCH (H)	30	FWD SEARCH (H)	P35−2
		31		
		32		
	−	33	GND	
		34		
	−	35	−12V	POWER2−1, L6S-37
	−	36	+12V	L6S-38
	−	37	+5V	POWER2-7
	−	38	+5V	
	−	39	GND	
	−	40	GND	

To FRONT

	P5		
L6S-19B	1	SERIAL DATA FRT	P114-6
L5S-19B	2	SERIAL CK	P114-8
L5S-20B	3	STROB CK	P114-7
L6M-10A	4	AUTO OFF	P113-1
L6M-9A	5	EJECT SW	P112-1
L6M-11A	6	EJECT LAMP	P112-2
L6M-9B	7	REM 1 LED (L)	P103-1
L6M-10B	8	REM 2 LED (L)	P103-2

TO CHASSIS INTERMEDIATE

	P10		
L5M-21	1	PG	P461-1
L5M-22	2	(GND)	P461-2
L5M-23	3	FG	P461-3
L5M-24	4	(GND)	P461-4
L5M-26A	5	+B	P461-5

To CHASSIS INTERMEDIATE

	P13		
L5S-25B	1	TR PH 1	P456-1
L5S-25A	2	TR PH 2	P456-2
L5S-26B	3	STENSION Va	P456-3
L5S-27B	4	S TENSION	P456-4
L5S-28B	5	S TENSION END	P456-5
L5S-26A	6	T TENSION Va	P456-6
L5S-27A	7	T TENSION	P456-7
L5S-28A	8	T TENSION GND	P456-8

To S0

	P14		
L5M-12B	1	Y H SW	P62-1
L5M-11B	2	GND	P62-2
L5M-13B	3	C H SW	P62-3
L5M-14B	4	GND	P62-4
L5M-12A	5	AT REF H SW	P64-6
L5M-11A	6	GND	P64-7
	7		
L6S-5A	8	TAPE N-FMT (L)	
	9		
L6M-49B	10	SEARCH (+)	P62-7
L6M-48B	11	FM ATT (L)	P62-6
L6S-19A	12	FM MUT (L)	P62-5

To FRONT PANEL

	P19		
L6M-44B	1	TAPE STOP (H)	P48-1
	2	TIMER GND	P48-2
	3	+12V	P48-3
L5M-25A	4	TIMER OUT	P48-4

OPTION (HOUR METER SUB)

To S0

	P22		
L5M-40B	1	FG1 OUT	P64-3
L5M-40A	2	FG2 OUT	P64-4
L5M-41B	3	GND	P64-5

To FRONT

	P23		
	1	+5V	P113-2
	2	+5V	P112-3
	3	+5V	P103-4
	4	+12V	P151-1
	5	+12V	P134-6
	6	−12V	P134-8
L5M-25A	7	TIMER OUT	P105-1
	8	TIMER GND	P105-3
L5M-37B	9	TR VR (+)	P116-1
L5M-38B	10	TR VR (−)	P116-2

To S0

	P27		
L6M25A	1	GND	P75-1
L6M25B	2	TC PB	P75-2
L6M17A	3	GND	P75-3

To S0

	P28		
L5M32B	1	MR CTL OUT	P64-1
—	2		P64-2
—	3	—	—

TO CAPSTAN MOTOR

	P30		
L5M-42	1	FG COM	P07-2
L5M-43	2	FG2	P07-3
L5M-44	3	FG1	P07-1

To S0

	P35		
L5M-33A	1	DRUM SERVO	P77-5
L5S-30A	2	FWD SEARCH (H)	P78-1
L5S-30B	3	REV SEARCH (H)	P78-2
	4		
L6M-31A	5	SHUTTLE (H)	P78-3
L6S-30B	6	T BRK SOL	P78-6
L6S-1B	7	ATT1	P76-1
L6S-2B	8	ATT2	P76-2
L6S-7A	9	LOADING MUT (L)	P78-4
L6M-35B	10	FAN STOP (L)	P78-7

	P39		
L5M45B	1	PCM H SW	
L5M46B	2	PCM GATE	
	3	GND	
L6S21A	4	PCM EE1	
L6S22A	5	PCM EE2	
L6S23A	6	STBY (L)	
L6S24A	7	PLAY (L)	
L6M30A	8	R/P HEAD	
L6M29B	9	TAPE R/P	
L1S-10A	10	HD	
	11	GND	
L6S25B	12	POWER ON (L)	

To JACK (PCM ONLY)

TO SERVO DRIVE

	P42		
L5S-1A	1	DRUM ON	P409-1
L5S-2A	2	V REF (DRUM)	P409-2
L5S-3A	3	ERROR(DRUM)	P409-3
L5S-4A	4	GND	P409-4
L5S-5A	5	CAP ON	P409-5
L5S-6A	6	CAP FWD	P409-6
L5S-7A	7	ERROR (CAP)	P409-7
L5S-8A	8	V REF (CAP)	P409-8
L5S-9A	9	GND	P409-9
—	10	—	—

TO SERVO DRIVE

	P43		
L5S-1B	1	REEL ON (H)	P415-1
L5S-2B	2	S DRIVE CONT	P415-2
L5S-3B	3	GND	P415-3
L5S-4B	4	T DRIVE CONT	P415-4
L5S-5B	5	GND	P415-5
L5S-6B	6	S BRAKE (H)	P415-6
L5S-7B	7	T BRAKE (H)	P415-7
L5S-8B	8	L CASSET	P415-8
	9	+12V	P415-9
	10	GND	P415-10
	11	+24V	P415-11
P32-8, 9	12	UNREG GND	P415-12

To S0

	POWER 2		
L5S35A	1	−12V	POWER5-1
L3S13A	2	−5V	POWER5-2
—	3	GND	POWER5-3
—	4	GND	POWER5-4
—	5	+12V (L)	POWER5-5
—	6		POWER5-6
POWER1-2, L5M-3A, L5S-37A	7	+5V	POWER5-7

To A/C HEAD

	CN11	
L5M34A	1	MR HEAD
L5M34B	2	(GND)

To A/C HEAD

	CN12	
L5M-36	1	CTL H (+)
L5M-35	2	CTL H (−)

L-5M		SERVO & REEL			
B		NO	A		
	–	1	GND		
		2	GND		
		3	+5V	POWER2-7	
L3M-4A, 5A	–	4	-12V		
L6M-43B	CAP OSC	5	5.96MHz	L6M-43A	
		6			
		7			
	–	8	GND		
		9	Y R/P H SW	L6S-21B	
		10			
P14-2	–	11	GND	P14-6	
L2M-40A P14-1	Y H SW	12	AT REF H SW	P14-5	
P14-3	C H SW	13			
P14-4	GND	14			
	GND	15			
		16			
		17			
L3S-9A	E-E	18			
P27-5	GND	19			
		20			
	–	21	PG	P10-1	
	–	22	(GND)	P10-2	
	–	23	FG	P10-3	
	–	24	(GND)	P10-4	
		25	TIMER OUT	P23-7	P19-4
		26	+B	P10-5	
		27			
		28			
L2M-35B	GND	29	PB SYNC	L2M-35A	L6M-19B
L1M-36B	GND	30	25Hz	L1M-35B	
L2M-31B	GND	31	PB FRAMING (1)	L2M-31A	
P28-1	WR CTL OUT	32	DRUM LOCK	L6M-41A	
L3S-10A L6M-46B	SERVO LOCK	33	DRUM SERVO	P35-1	
CN11-2	(GND)	34	MR HEAD	CN11-1	
	–	35	CTL HEAD ⊖	CN12-2	
	–	36	CTL HEAD ⊕	CN12-1	
P23-9	TR VR ⊕	37	GND	L6S-32A	
P23-10	TR VR ⊖	38	CAP OVERRIDE	L6S-31A	
	–	39	GND	P22-2	
P22-1	FG1 OUT	40	FG 2 OUT	P22-6	
P22-3	GND	41	TAPE FWD	L6S-16A	
	–	42	FG COM	P30-1	
	–	43	FG 2	P30-2	
	–	44	FG 1	P30-3	
P39-1	PCM H SW	45	FIELD SELECT 1	L6S-6B	
P39-2	PCM GATE	46	FIELD SELECT 2	L6S-7B	
L6S-22B	PCM ERASE	47	FIELD SELECT 3	L6S-10B	
L3M-45A, 46A	–	48	+12V		
	–	49	GND		
	–	50	GND		

L-5S		SERVO & REEL			
B		NO	A		
P43-1	REEL ON Ⓜ	1	CYL ON	P42-1	
P43-2	S DRIVE CONT	2	V REF (DRUM)	P42-2	
P43-3	GND	3	ERROR (DRUM)	P42-3	
P43-4	T DRIVE CONT	4	GND	P42-4	
P43-5	GND	5	CAP ON	P42-5	
P43-6	S BRAKE Ⓗ	6	CAP FWD	P42-6	
P43-7	T BRAKE Ⓗ	7	ERROR (CAP)	P42-7	
P43-8	L CASSET	8	V REF (CAP)	P42-8	
		9	GND	P42-9	
		10			
	GND	11	GND		
		12			
		13			
		14			
		15	REF CF	L1S-3A	
L6S-3B	CF LOCK Ⓛ	16	GND	L6M-50A	
L6S-4B	CF MODE Ⓛ	17	CTL PULSE	L6M-49A	
L6S-25A	4F Ⓛ	18	AUTO/FORCED	L6S-1A	
P5-2 L6S-17A	SERIAL CK	19	SERIAL DATA (C)	L6S-17B	
P5-3 L6S-18A	STRB CK	20	SERIAL DATA (R)	L6S-18B	
		21	SERIAL DATA (T)	L6S-16B	
L6S-13B	REF 25/2Hz	22	REF 25/4Hz	L6S-13A	
L6S-14A	TR FG 1	23	TR FG 2	L6S-15A	
L6M-46A	TAPE SLACK	24			
P13-1	TR PH 1	25	TR PH 2	P13-2	
P13-3	S TENSION Va	26	T TENSION Va	P13-6	
P13-4	S TENSION	27	T TENSION	P13-7	
P13-5	S TENSION GND	28	T TENSION GND	P13-8	
		29			
P35-3 L3M-36A	REV SEARCH Ⓗ	30	FWD SEARCH Ⓗ	P35-2	
		31			
		32			
	–	33	GND		
		34			
	–	35	-12V	POWER2-1	L6S-37
	–	36	+12V	L6S-38	
	–	37	+5V	POWER2-7	
	–	38	+5V		
	–	39	GND		
	–	40	GND		

To FRONT

		P5	
L6S-19B	1	SERIAL DATA FRT	P114-6
L5S-19B	2	SERIAL CK	P114-8
L5S-20B	3	STROB CK	P114-7
L6M-10A	4	AUTO OFF	P113-1
L6M-9A	5	EJECT SW	P112-1
L6M-11A	6	EJECT LAMP	P112-2
L6M-9B	7	REM 1 LED Ⓛ	P103-1
L6M-10B	8	REM 2 LED Ⓛ	P103-2

TO CHASSIS INTERMEDIATE

		P10	
L5M-21	1	PG	P461-1
L5M-22	2	(GND)	P461-2
L5M-23	3	FG	P461-3
L5M-24	4	(GND)	P461-4
L5M-26A	5	+B	P461-5

To CHASSIS INTERMEDIATE

		P13	
L5S-25B	1	TR PH 1	P456-1
L5S-25A	2	TR PH 2	P456-2
L5S-26B	3	S TENSION Va	P456-3
L5S-27B	4	S TENSION	P456-4
L5S-28B	5	S TENSION END	P456-5
L5S-26A	6	T TENSION Va	P456-6
L5S-27A	7	T TENSION	P456-7
L5S-28A	8	T TENSION GND	P456-8

To S0

		P14	
L5M-12B	1	Y H SW	P62-1
L5M-11B	2	GND	P62-2
L5M-13B	3	C H SW	P62-3
L5M-14B	4	GND	P62-4
L5M-12A	5	AT REF H SW	P64-6
L5M-11A	6	GND	P64-7
	7		
L6S-5A	8	TAPE N-FMT Ⓛ	
	9		
L6M-49B	10	SEARCH Ⓗ	P62-7
L6M-48B	11	FM ATT Ⓛ	P62-6
L6S-19A	12	FM MUT Ⓛ	P62-5

To FRONT PANEL

		P19	
L6M-44B	1	TAPE STOP Ⓗ	P48-1
	2	TIMER GND	P48-2
	3	+12V	P48-3
L5M-25A	4	TIMER OUT	P48-4

OPTION (HOUR METER SUB)

To S0

		P22	
L5M-40B	1	FG1 OUT	P64-3
L5M-40A	2	FG2 OUT	P64-4
L5M-41B	3	GND	P64-5

To FRONT

		P23	
	1	+5V	P113-2
	2	+5V	P112-3
	3	+5V	P103-4
	4	+12V	P151-1
	5	+12V	P134-6
	6	-12V	P134-8
L5M-25A	7	TIMER OUT	P105-1
	8	TIMER GND	P105-3
L5M-37B	9	TR VR ⊕	P116-1
L5M-38B	10	TR VR ⊖	P116-2

To S0

		P27	
L6M25A	1	GND	P75-1
L6M25B	2	TC PB	P75-2
L6M17A	3	GND	P75-3

To S0

		P28	
L5M32B	1	MR CTL OUT	P64-1
—	2		P64-2
—	3	—	—

TO CAPSTAN MOTOR

		P30	
L5M-42	1	FG COM	P07-2
L5M-43	2	FG2	P07-3
L5M-44	3	FG1	P07-1

To S0

		P35	
L5M-33A	1	DRUM SERVO	P77-5
L5S-30A	2	FWD SEARCH Ⓗ	P78-1
L5S-30B	3	REV SEARCH Ⓗ	P78-2
	4		
L6M-31A	5	SHUTTLE Ⓗ	P78-3
L6S-30B	6	T BRK SOL	P78-6
L6S-1B	7	ATT1	P76-1
L6S-2B	8	ATT2	P76-2
L6S-7A	9	LOADING MUT Ⓛ	P78-4
L6M-35B	10	FAN STOP Ⓛ	P78-7

		P39	
L5M45B	1	PCM H SW	
L5M46B	2	PCM GATE	
	3	GND	
L6S21A	4	PCM EE1	
L6S22A	5	PCM EE2	
L6S23A	6	STBY Ⓛ	
L6S24A	7	PLAY Ⓛ	
L6M30A	8	R/P HEAD	
L6M29B	9	TAPE R/P	
L1S-10A	10	NO	
	11	GND	
L6S25B	12	POWER ON Ⓛ	

To JACK (PCM ONLY)

TO SERVO DRIVE

		P42	
L5S-1A	1	DRUM ON	P409-1
L5S-2A	2	V REF (DRUM)	P409-2
L5S-3A	3	ERROR (DRUM)	P409-3
L5S-4A	4	GND	P409-4
L5S-5A	5	CAP ON	P409-5
L5S-6A	6	CAP FWD	P409-6
L5S-7A	7	ERROR (CAP)	P409-7
L5S-8A	8	V REF (CAP)	P409-8
L5S-9A	9	GND	P409-9
—	10	—	—

TO SERVO DRIVE

		P43	
L5S-1B	1	REEL ON Ⓜ	P415-1
L5S-2B	2	S DRIVE CONT	P415-2
L5S-3B	3	GND	P415-3
L5S-4B	4	T DRIVE CONT	P415-4
L5S-5B	5	GND	P415-5
L5S-6B	6	S BRAKE Ⓗ	P415-6
L5S-7B	7	T BRAKE Ⓗ	P415-7
L5S-8B	8	L CASSET	P415-8
	9	+12V	P415-9
	10	GND	P415-10
	11	+24V	P415-11
P32-8, 9	12	UNREG GND	P415-12

To S0

		POWER 2	
L5S35A	1	-12V	POWER5-1
L3S13A	2	-5V	POWER5-2
—	3	GND	POWER5-3
—	4	GND	POWER5-4
—	5	+12V Ⓛ	POWER5-5
—	6		POWER5-6
POWER1 12 L5M3A L5S37A	7	+5V	POWER5-7

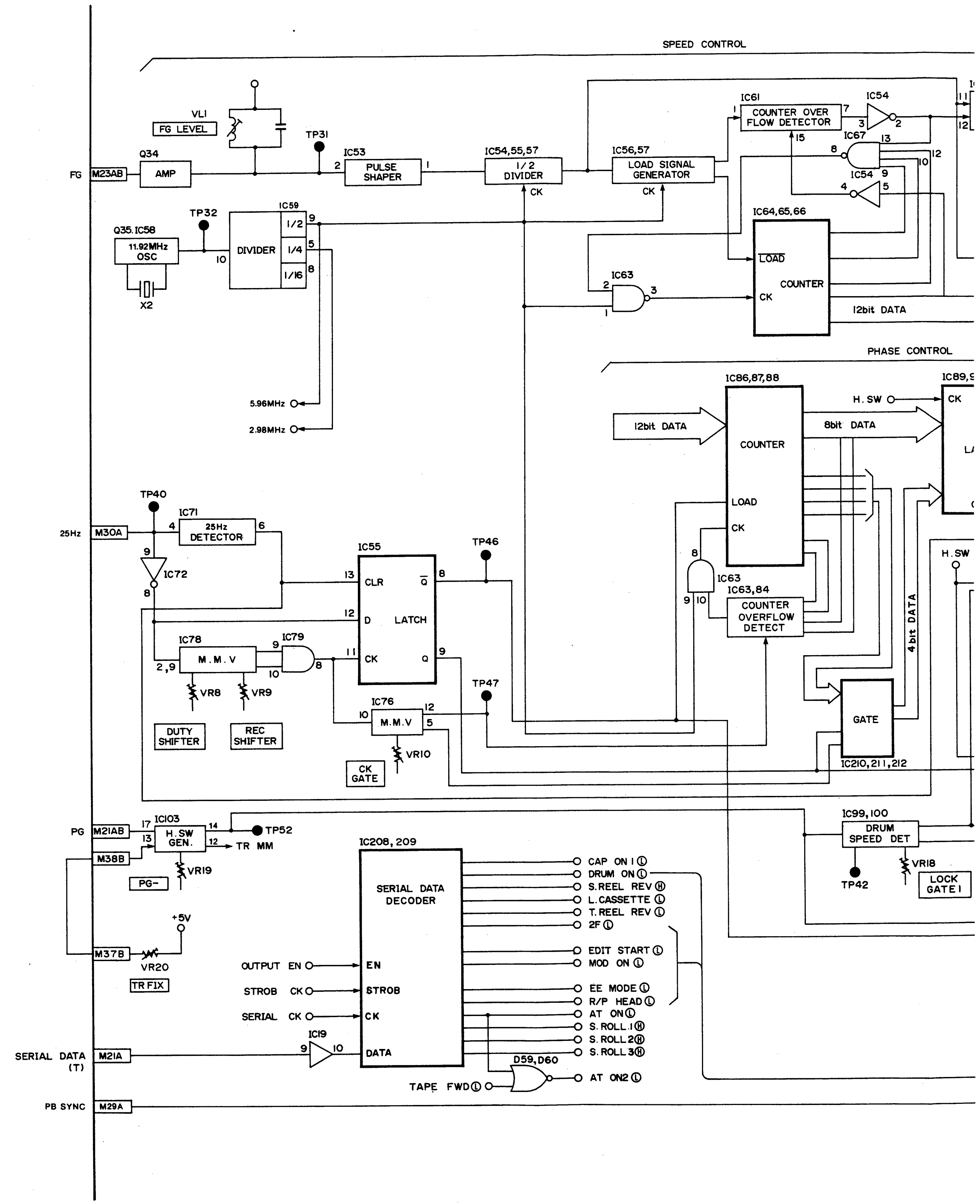
To A/C HEAD

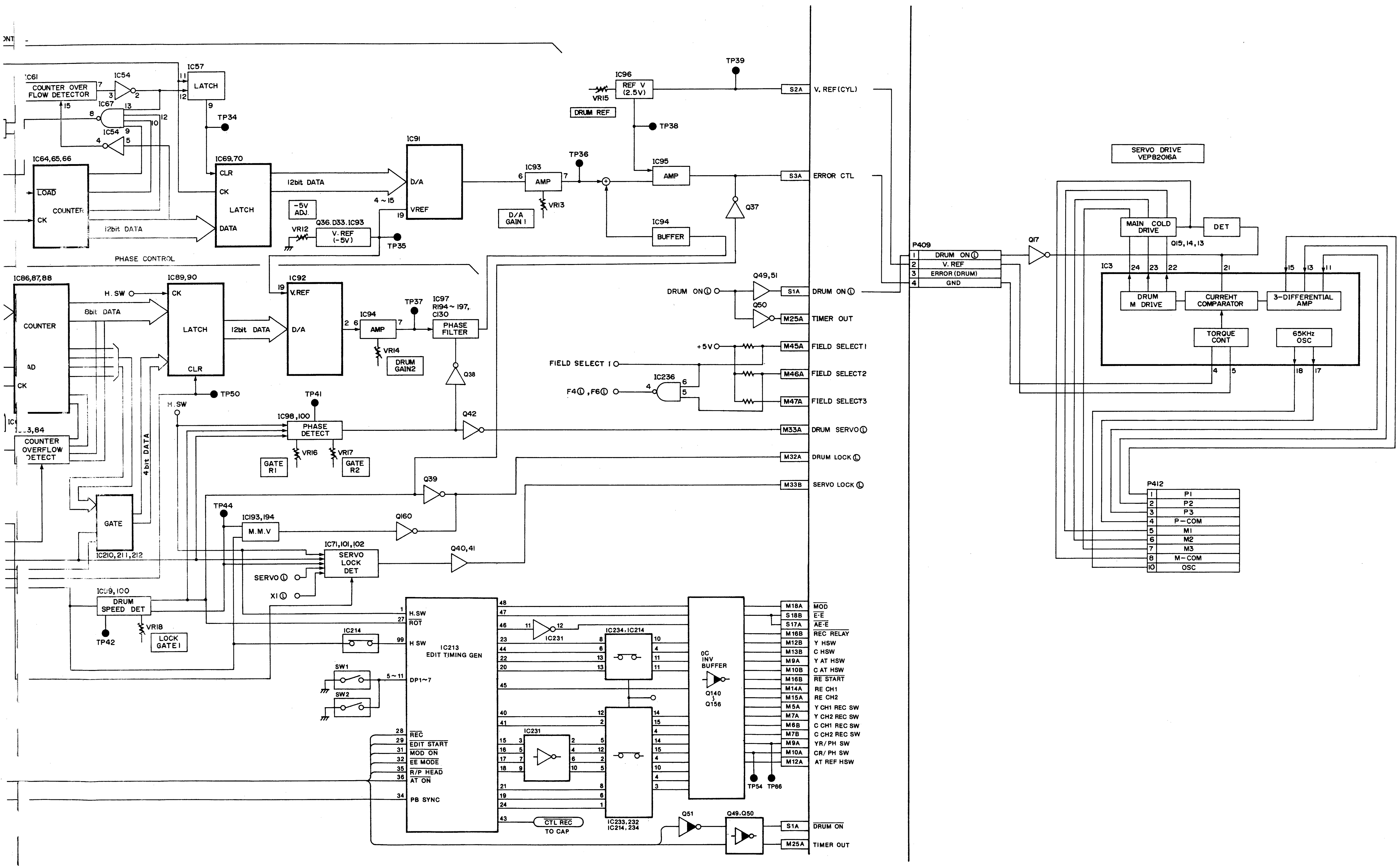
		CN11
L5M34A	1	MR HEAD
L5M34B	2	(GND)

To A/C HEAD

		CN12
L5M-36	1	CTL H⊕
L5M-35	2	CTL H⊖

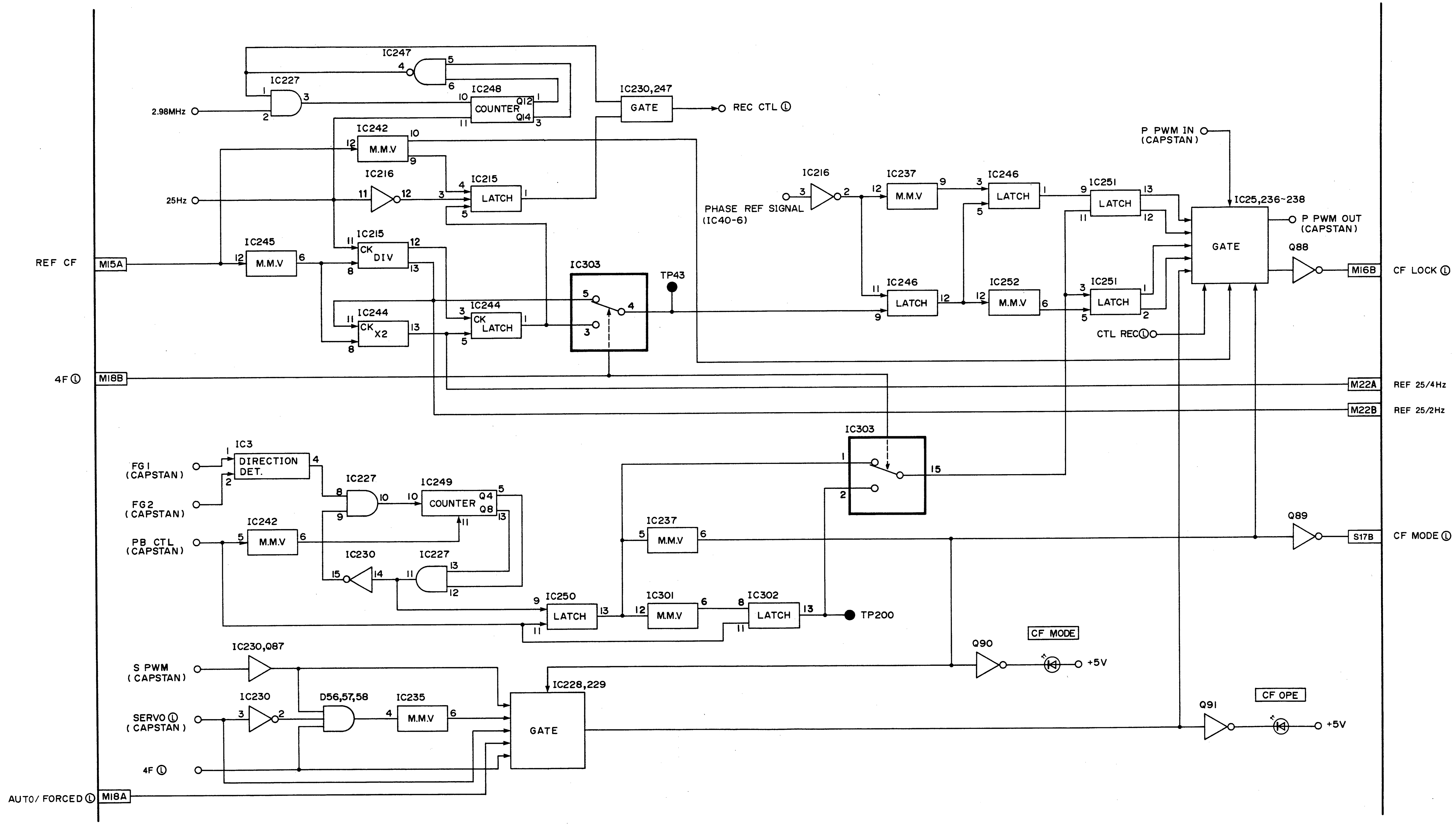
L5 DRUM SERVO BLOCK DIAGRAM (1/2)





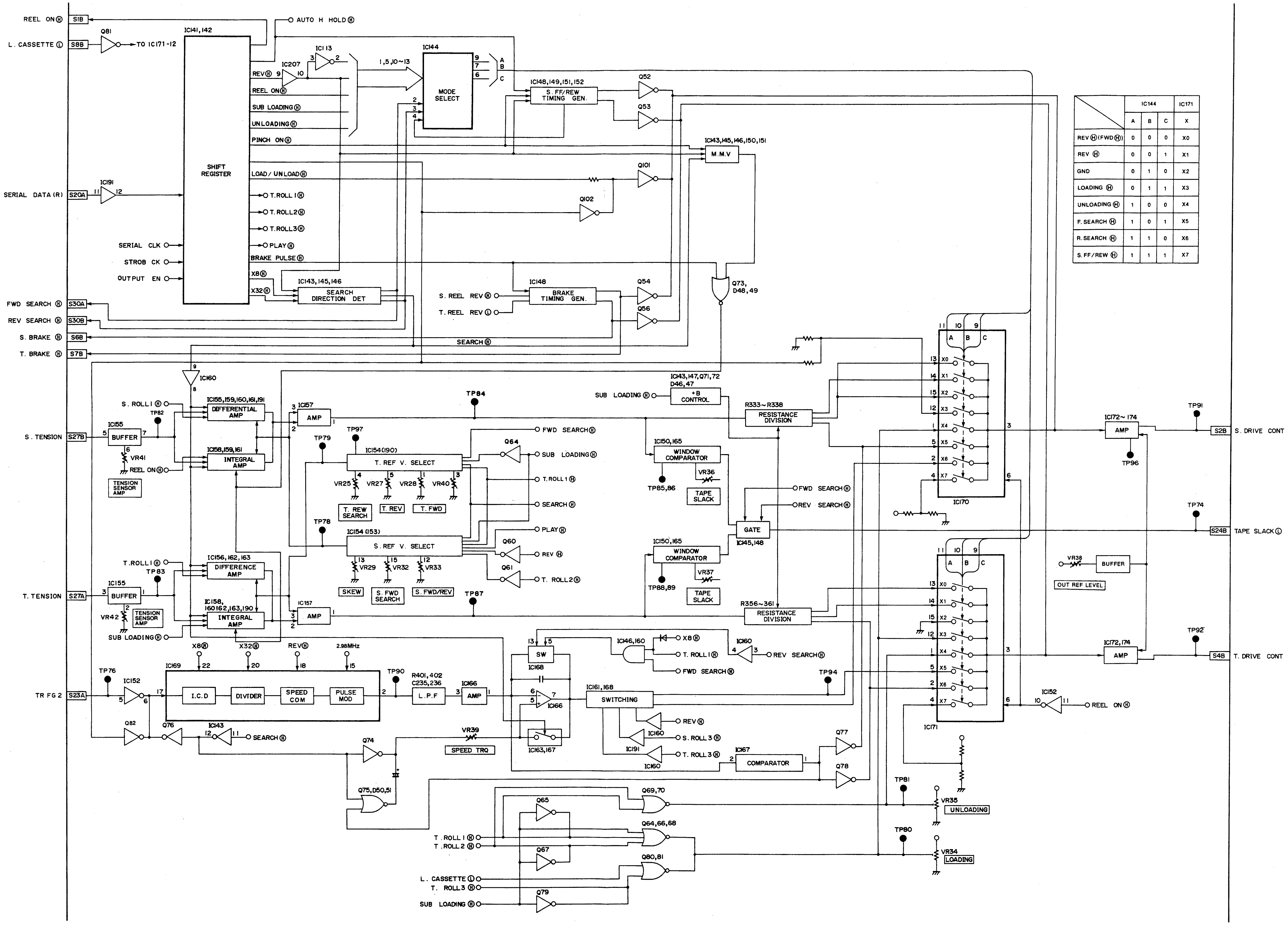
COUNTER OVER FLOW DETECTOR
LATCH
PHASE CONTROL
COUNTER
12bit DATA
8bit DATA
D/A
VREF
AMP
REF V (2.5V)
DRUM REF
BUFFER
V. REF (-5V)
-5V ADJ.
D/A GAIN I
DRUM GAIN2
PHASE FILTER
PHASE DETECT
GATE R1
GATE R2
COUNTER OVERFLOW DETECT
GATE
4 bit DATA
M.M.V
SERVO LOCK DET
DRUM SPEED DET
LOCK GATE I
IC213 EDIT TIMING GEN
OC INV BUFFER
CTL REC TO CAP
V. REF (CYL)
ERROR CTL
DRUM ON
TIMER OUT
FIELD SELECT1
FIELD SELECT2
FIELD SELECT3
DRUM SERVO
DRUM LOCK
SERVO LOCK
MOD
E-E
AE-E
REC RELAY
Y HSW
C HSW
Y AT HSW
C AT HSW
RE START
RE CH1
RE CH2
Y CH1 REC SW
Y CH2 REC SW
C CH1 REC SW
C CH2 REC SW
YR/PH SW
CR/PH SW
AT REF HSW
SERVO DRIVE VEP82016A
MAIN COLD DRIVE
DET
DRUM M DRIVE
CURREHT COMPARATOR
3-DIFFERENTIAL AMP
TORQUE CONT
65KHz OSC
P409
DRUM ON
V. REF
ERROR (DRUM)
GND
P412
P1
P2
P3
P-COM
M1
M2
M3
M-COM
OSC

L5 DRUM SERVO BLOCK DIAGRAM (2/2)



REVERSE SIDE
L5 DURM SERVO (1/2)

L5 REEL SERVO BLOCK DIAGRAM



	IC144			IC171
	A	B	C	X
REV Ⓗ (FWD Ⓗ)	0	0	0	X0
REV Ⓗ	0	0	1	X1
GND	0	1	0	X2
LOADING Ⓗ	0	1	1	X3
UNLOADING Ⓗ	1	0	0	X4
F. SEARCH Ⓗ	1	0	1	X5
R. SEARCH Ⓗ	1	1	0	X6
S. FF/REW Ⓗ	1	1	1	X7

L6 SYSTEM COTNROL BLOCK DIAGRAM (1/2)

L-5M		SERVO & REEL		
B		NO	A	
	-	1	GND	
	-	2	GND	
	-	3	+5V	POWER2-7
L3M-4A, 5A	-	4	-12V	
L6M-43B	CAP OSC	5	5.96MHz	L6M-43A
		6		
		7		
	-	8	GND	
		9	Y R/P H SW	L6S-21B
		10		
P14-2	-	11	GND	P14-6
L2M-40A | P14-1	Y H SW	12	AT REF H SW	P14-5
P14-3	C H SW	13		
P14-4	GND	14		
	GND	15		
		16		
		17		
L3S-9A	E-E	18		
P27-5	GND	19		
		20		
	-	21	PG	P10-1
	-	22	(GND)	P10-2
	-	23	FG	P10-3
	-	24	(GND)	P10-4
		25	TIMER OUT	P23-7 | P19-4
		26	+B	P10-5
		27		
		28		
L2M-35B	GND	29	PB SYNC	L2M-35A | L6M-19B
L1M-33B	GND	30	25Hz	L1M-35B
L3M-31B	GND	31	PB FRAMING (1)	L2M-31A
P2[illegible]	WR CTL OUT	32	DRUM LOCK	L6M-41A
L3S-10A | L6M46B	SERVO LOCK	33	DRUM SERVO	P35-1
CN11-2	(GND)	34	MR HEAD	CN11-1
	-	35	CTL HEAD ⊝	CN12-2
	-	36	CTL HEAD ⊕	CN12-1
P23-9	TR VR ⊕	37	GND	L6S-32A
P23-10	TR VR ⊝	38	CAP OVERRIDE	L6S-31A
	-	39	GND	P22-2
P22-1	FG1 OUT	40	FG 2 OUT	P22-6
P22-3	GND	41	TAPE FWD	L6S-16A
	-	42	FG COM	P30-1
	-	43	FG2	P30-2
	-	44	FG1	P30-3
P39-1	PCM H SW	45	FIELD SELECT 1	L6S-6B
P39-2	PCM GATE	46	FIELD SELECT 2	L6S-7B
L6S-22B	PCM ERASE	47	FIELD SELECT 3	L6S-10B
L3M-45A,46A	-	48	+12V	
	-	49	GND	
	-	50	GND	

L-5S		SERVO & REEL		
B		NO	A	
P43-1	REEL ON Ⓜ	1	CYL ON	P42-1
P43-2	S DRIVE CONT	2	V REF (DRUM)	P42-2
P43-3	GND	3	ERROR (DRUM)	P42-3
P43-4	T DRIVE CONT	4	GND	P42-4
P43-5	GND	5	CAP ON	P42-5
P43-6	S BRAKE Ⓗ	6	CAP FWD	P42-6
P43-7	T BRAKE Ⓗ	7	ERROR (CAP)	P42-7
P43-8	L CASSET	8	V REF (CAP)	P42-8
		9	GND	P42-9
		10		
	GND	11	GND	
		12		
		13		
		14		
		15	REF CF	L1S-3A
L6S-3B	CF LOCK Ⓛ	16	GND	L6M-50A
L6S-4B	CF MODE Ⓛ	17	CTL PULSE	L6M-49A
L6S-25A	4F Ⓛ	18	AUTO/FORCED	L6S-1A
P5-2 | L6S-17A	SERIAL CK	19	SERIAL DATA (C)	L6S-17B
P5-3 | L6S-18A	STRB CK	20	SERIAL DATA (R)	L6S-18B
		21	SERIAL DATA (T)	L6S-16B
L6S-13B	REF 25/2Hz	22	REF 25/4Hz	L6S-13A
L6S-14A	TR FG 1	23	TR FG 2	L6S-15A
L6M-46A	TAPE SLACK	24		
P13-1	TR PH 1	25	TR PH 2	P13-2
P13-3	S TENSION Va	26	T TENSION Va	P13-6
P13-4	S TENSION	27	T TENSION	P13-7
P13-5	S TENSION GND	28	T TENSION GND	P13-8
		29		
P35-3 | L3M-36A	REV SEARCH Ⓗ	30	FWD SEARCH Ⓗ	P35-2
		31		
		32		
	-	33	GND	
		34		
	-	35	-12V	POWER2-1 | L6S-37
	-	36	+12V	L6S-38
	-	37	+5V	POWER2-7
	-	38	+5V	
	-	39	GND	
	-	40	GND	

To FRONT

P5			
L6S-19B	1	SERIAL DATA FRT	P114-6
L5S-19B	2	SERIAL CK	P114-8
L5S-20B	3	STROB CK	P114-7
L6M-10A	4	AUTO OFF	P113-1
L6M-9A	5	EJECT SW	P112-1
L6M-11A	6	EJECT LAMP	P112-2
L6M-9B	7	REM 1 LED Ⓛ	P103-1
L6M-10B	8	REM 2 LED Ⓛ	P103-2

TO CHASSIS INTERMEDIATE

P10			
L5M-21	1	PG	P461-1
L5M-22	2	(GND)	P461-2
L5M-23	3	FG	P461-3
L5M-24	4	(GND)	P461-4
L5M-26A	5	+B	P461-5

To CHASSIS INTERMEDIATE

P13			
L5S-25B	1	TR PH 1	P456-1
L5S-25A	2	TR PH 2	P456-2
L5S-26B	3	STENSION Va	P456-3
L5S-27B	4	S TENSION	P456-4
L5S-28B	5	S TENSION END	P456-5
L5S-26A	6	T TENSION Va	P456-6
L5S-27A	7	T TENSION	P456-7
L5S-28A	8	T TENSION GND	P456-8

To S0

P14			
L5M-12B	1	Y H SW	P62-1
L5M-11B	2	GND	P62-2
L5M-13B	3	C H SW	P62-3
L5M-14B	4	GND	P62-4
L5M-12A	5	AT REF H SW	P64-6
L5M-11A	6	GND	P64-7
	7		
L6S-5A	8	TAPE N-FMT Ⓛ	
	9		
L6M-49B	10	SEARCH Ⓗ	P62-7
L6M-48B	11	FM ATT Ⓛ	P62-6
L6S-19A	12	FM MUT Ⓛ	P62-5

To FRONT PANEL

P19			
L6M-44B	1	TAPE STOP Ⓗ	P48-1
	2	TIMER GND	P48-2
	3	+12V	P48-3
L5M-25A	4	TIMER OUT	P48-4

OPTION (HOUR METER SUB)

To S0

P22			
L5M-40B	1	FG1 OUT	P64-3
L5M-40A	2	FG2 OUT	P64-4
L5M-41B	3	GND	P64-5

To FRONT

P23			
	1	+5V	P113-2
	2	+5V	P112-3
	3	+5V	P103-4
	4	+12V	P151-1
	5	+12V	P134-6
	6	-12V	P134-8
L5M-25A	7	TIMER OUT	P105-1
	8	TIMER GND	P105-3
L5M-37B	9	TR VR ⊕	P116-1
L5M-38B	10	TR VR ⊝	P116-2

To S0

P27			
L6M25A	1	GND	P75-1
L6M25B	2	TC PB	P75-2
L6M17A	3	GND	P75-3

To S0

P28			
L5M-32B	1	MR CTL OUT	P64-1
—	2		P64-2
—	3	—	—

TO CAPSTAN MOTOR

P30			
L5M-42	1	FG COM	P07-2
L5M-43	2	FG2	P07-3
L5M-44	3	FG1	P07-1

To S0

P35			
L5M-33A	1	DRUM SERVO	P77-5
L5S-30A	2	FWD SEARCH Ⓗ	P78-1
L5S-30B	3	REV SEARCH Ⓗ	P78-2
	4		
L6M-31A	5	SHUTTLE Ⓗ	P78-3
L6S-30B	6	T BRK SOL	P78-6
L6S-1B	7	ATT1	P76-1
L6S-2B	8	ATT2	P76-2
L6S-7A	9	LOADING MUT Ⓛ	P78-4
L6M-35B	10	FAN STOP Ⓛ	P78-7

P39			
L5M45B	1	PCM H SW	
L5M46B	2	PCM GATE	
	3	GND	
L6S21A	4	PCM EE1	
L6S22A	5	PCM EE2	
L6S23A	6	STBY Ⓛ	
L6S24A	7	PLAY Ⓛ	
L6M30A	8	R/P HEAD	
L6M29B	9	TAPE R/P	
L1S-10A	10	HD	
	11	GND	
L6S25B	12	POWER ON Ⓛ	

To JACK
(PCM ONLY)

TO SERVO DRIVE

P42			
L5S-1A	1	DRUM ON	P409-1
L5S-2A	2	V REF (DRUM)	P409-2
L5S-3A	3	ERROR (DRUM)	P409-3
L5S-4A	4	GND	P409-4
L5S-5A	5	CAP ON	P409-5
L5S-6A	6	CAP FWD	P409-6
L5S-7A	7	ERROR (CAP)	P409-7
L5S-8A	8	V REF (CAP)	P409-8
L5S-9A	9	GND	P409-9
—	10	—	—

TO SERVO DRIVE

P43			
L5S-1B	1	REEL ON Ⓗ	P415-1
L5S-2B	2	S DRIVE CONT	P415-2
L5S-3B	3	GND	P415-3
L5S-4B	4	T DRIVE CONT	P415-4
L5S-5B	5	GND	P415-5
L5S-6B	6	S BRAKE Ⓗ	P415-6
L5S-7B	7	T BRAKE Ⓗ	P415-7
L5S-8B	8	L CASSET	P415-8
	9	+12V	P415-9
	10	GND	P415-10
	11	+24V	P415-11
P32-8, 9	12	UNREG GND	P415-12

To S0

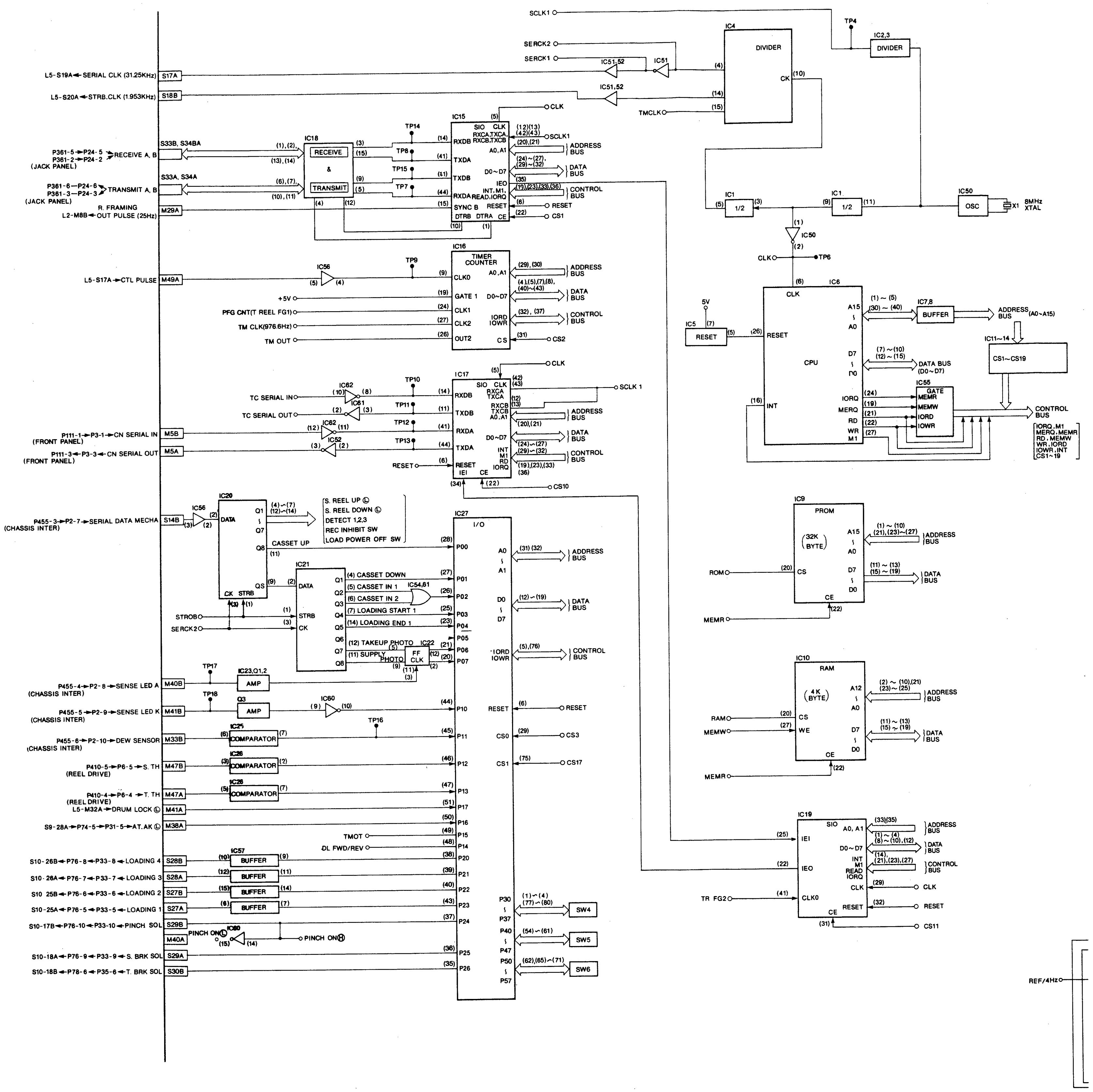
POWER 2			
L5S-35A	1	-12V	POWER5-1
L5S-13A	2	-5V	POWER5-2
—	3	GND	POWER5-3
—	4	GND	POWER5-4
—	5	+12V Ⓛ	POWER5-5
	6		POWER5-6
POWER1	7	+5V	POWER5-7
L5M-3A L5S-37A			

To A/C HEAD

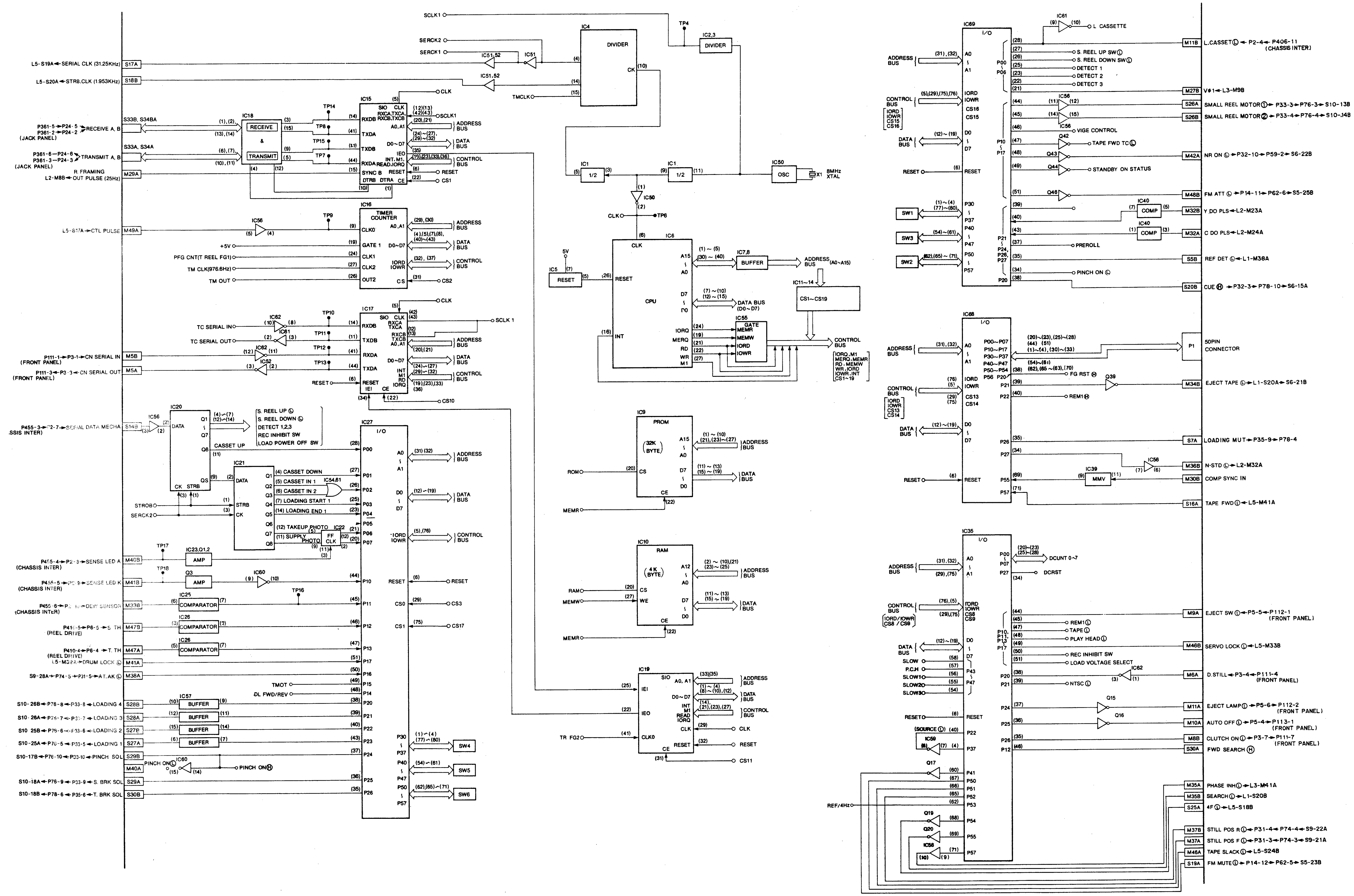
CN11		
L5M-34A	1	MR HEAD
L5M-34B	2	(GND)

To A/C HEAD

CN12		
L5M-36	1	CTL H⊕
L5M-35	2	CTL H⊝



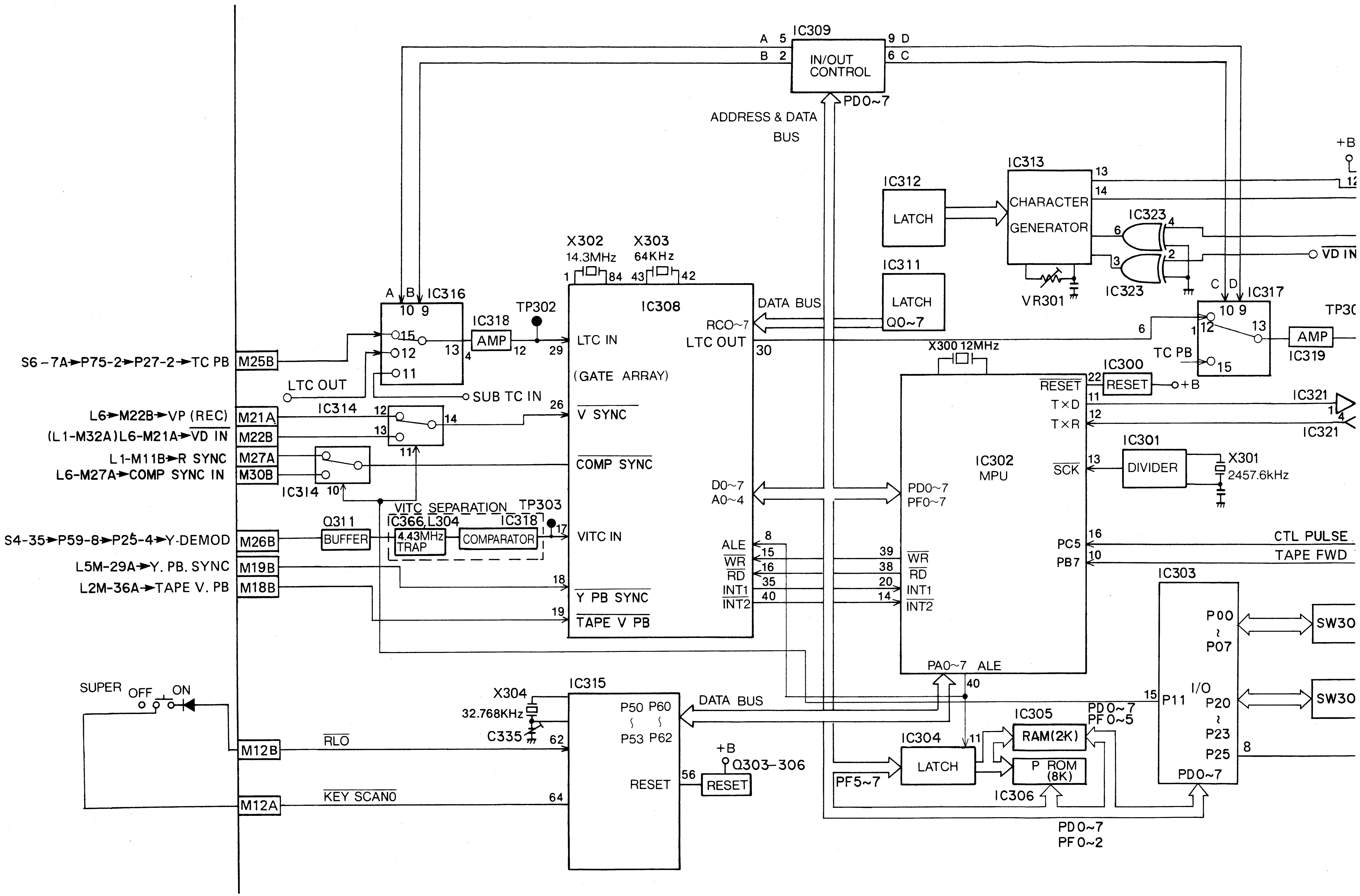
.6 SYSTEM COTNROL BLOCK DIAGRAM (1/2)



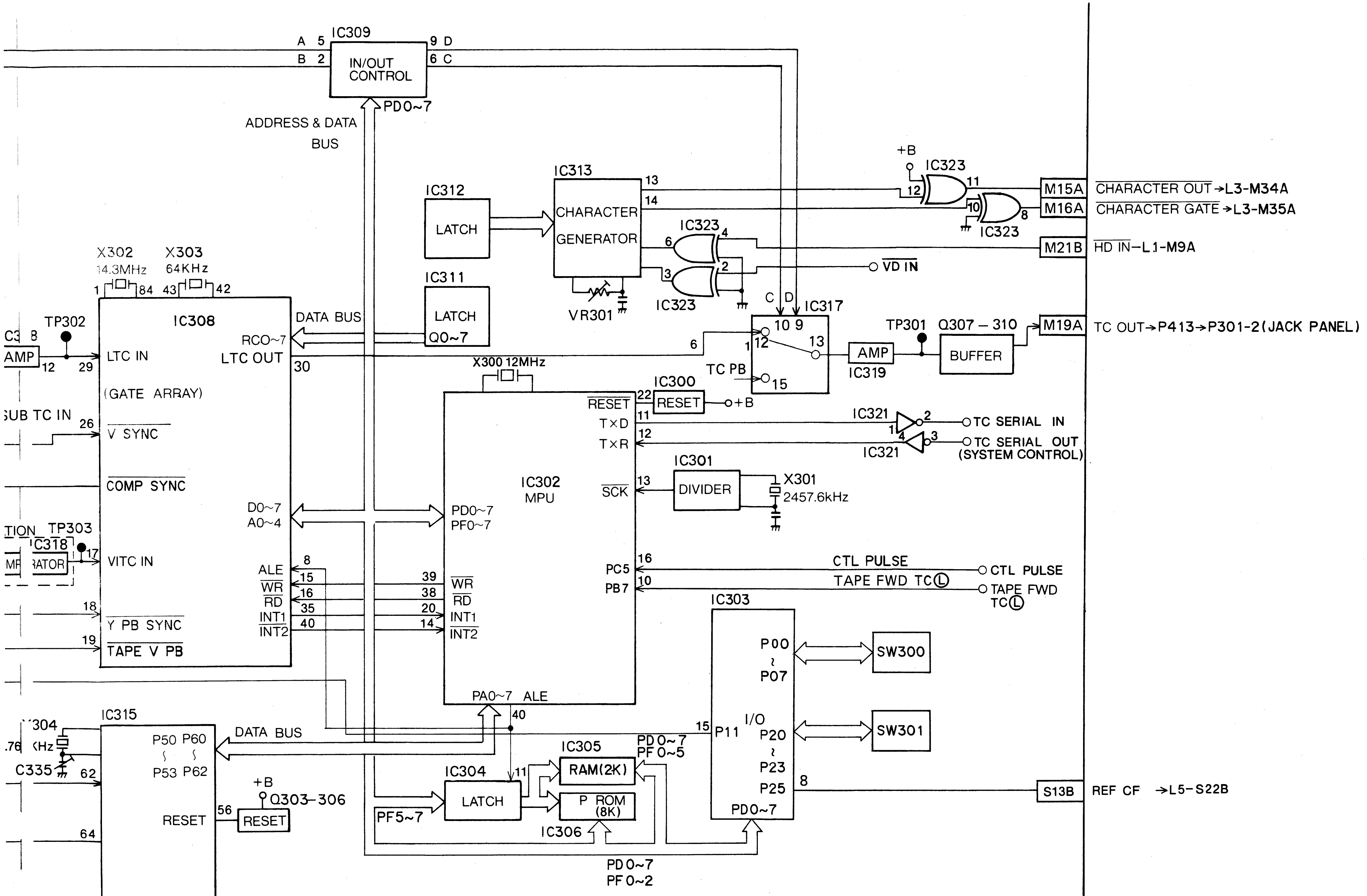
REVERSE SIDE

L6 SYSTEM CTL (VITC & LTC)

L6 SYSTEM CONTROL (VITC & LTC) BLOCK DIAGRAM

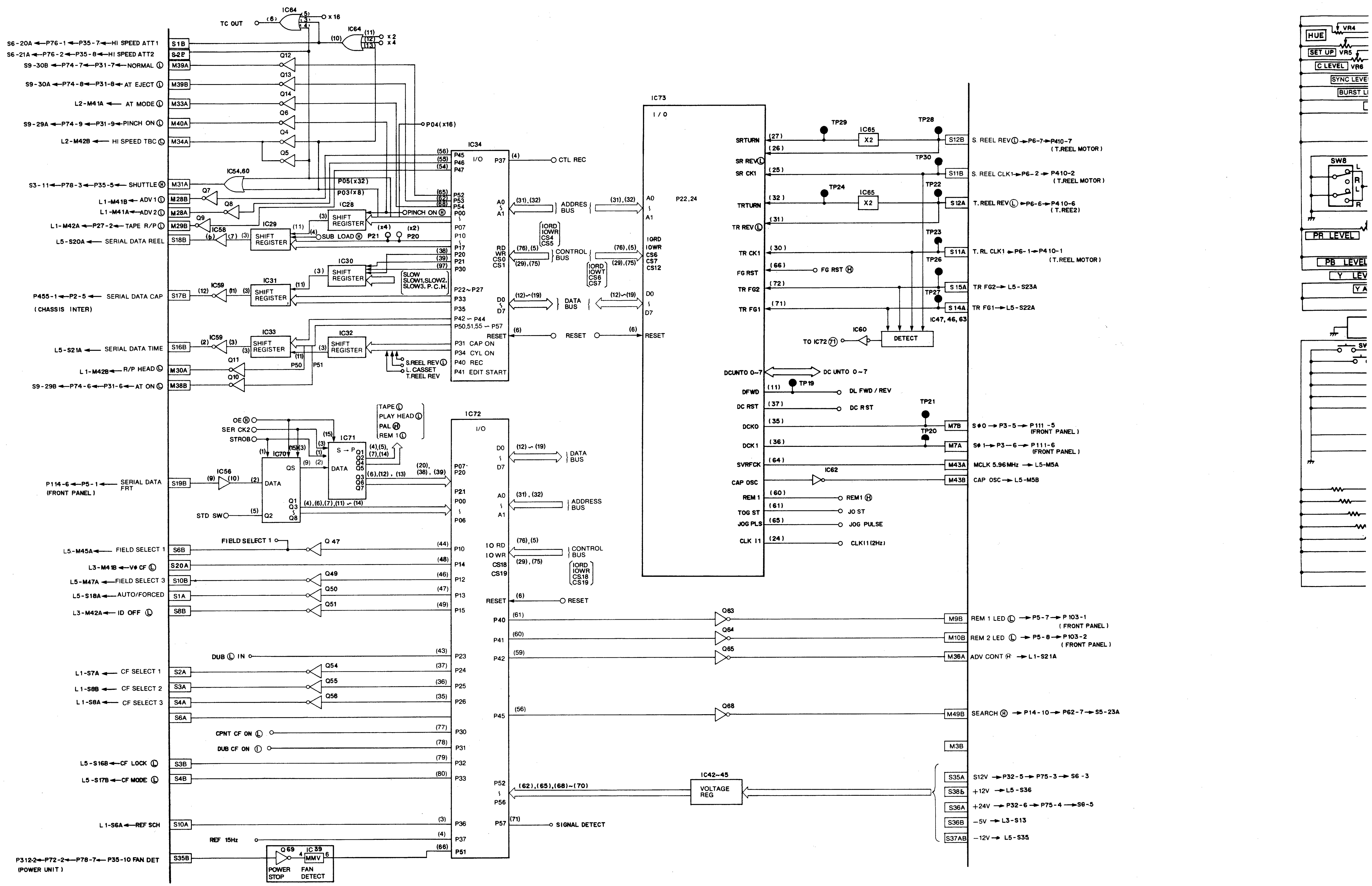


DIAGRAM

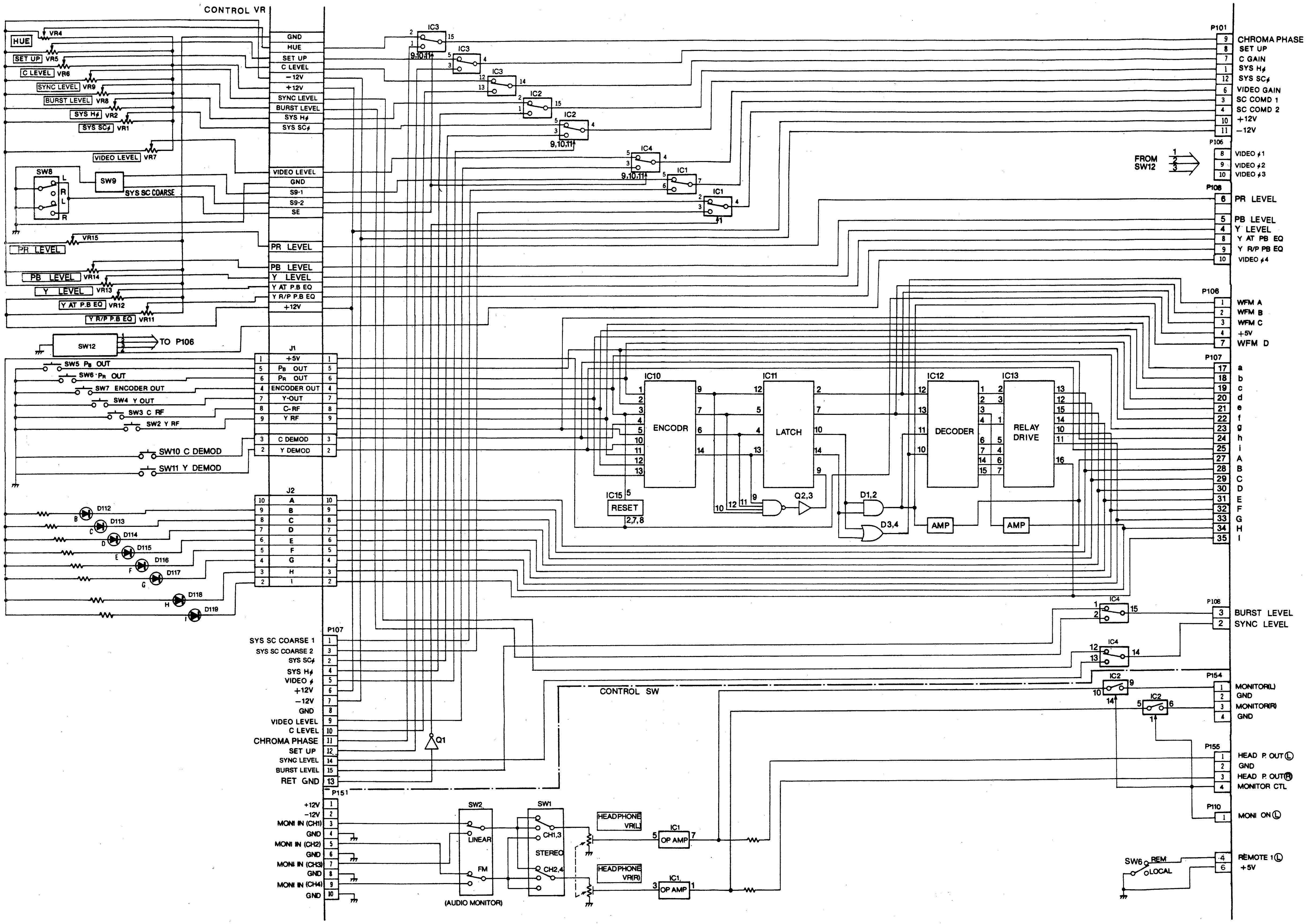


IC309
IN/OUT CONTROL
PD0~7
ADDRESS & DATA BUS
IC312
LATCH
IC313
CHARACTER GENERATOR
IC311
LATCH
Q0~7
VR301
IC323
+B
M15A
CHARACTER OUT→L3-M34A
M16A
CHARACTER GATE→L3-M35A
M21B
HD IN–L1-M9A
VD IN
IC317
TC PB
AMP
IC319
TP301
Q307 – 310
BUFFER
M19A
TC OUT→P413→P301-2(JACK PANEL)
X302
14.3MHz
X303
64KHz
IC308
TP302
LTC IN
(GATE ARRAY)
RCO~7
LTC OUT
DATA BUS
SUB TC IN
V SYNC
COMP SYNC
D0~7
A0~4
TP303
IC318
VITC IN
ALE
WR
RD
INT1
INT2
Y PB SYNC
TAPE V PB
X300 12MHz
IC302
MPU
PD0~7
PF0~7
RESET
TxD
TxR
SCK
IC300
RESET
IC321
TC SERIAL IN
TC SERIAL OUT
(SYSTEM CONTROL)
IC301
DIVIDER
X301
2457.6kHz
PC5
PB7
CTL PULSE
TAPE FWD TCⓁ
IC303
P00
P07
I/O
P11
P20
P23
P25
PD0~7
SW300
SW301
S13B
REF CF →L5-S22B
PA0~7 ALE
IC315
P50 P60
P53 P62
RESET
DATA BUS
+B
Q303–306
IC304
LATCH
IC305
RAM(2K)
P ROM (8K)
IC306
PF5~7
PD0~7
PF0~5
PD0~7
PF0~2

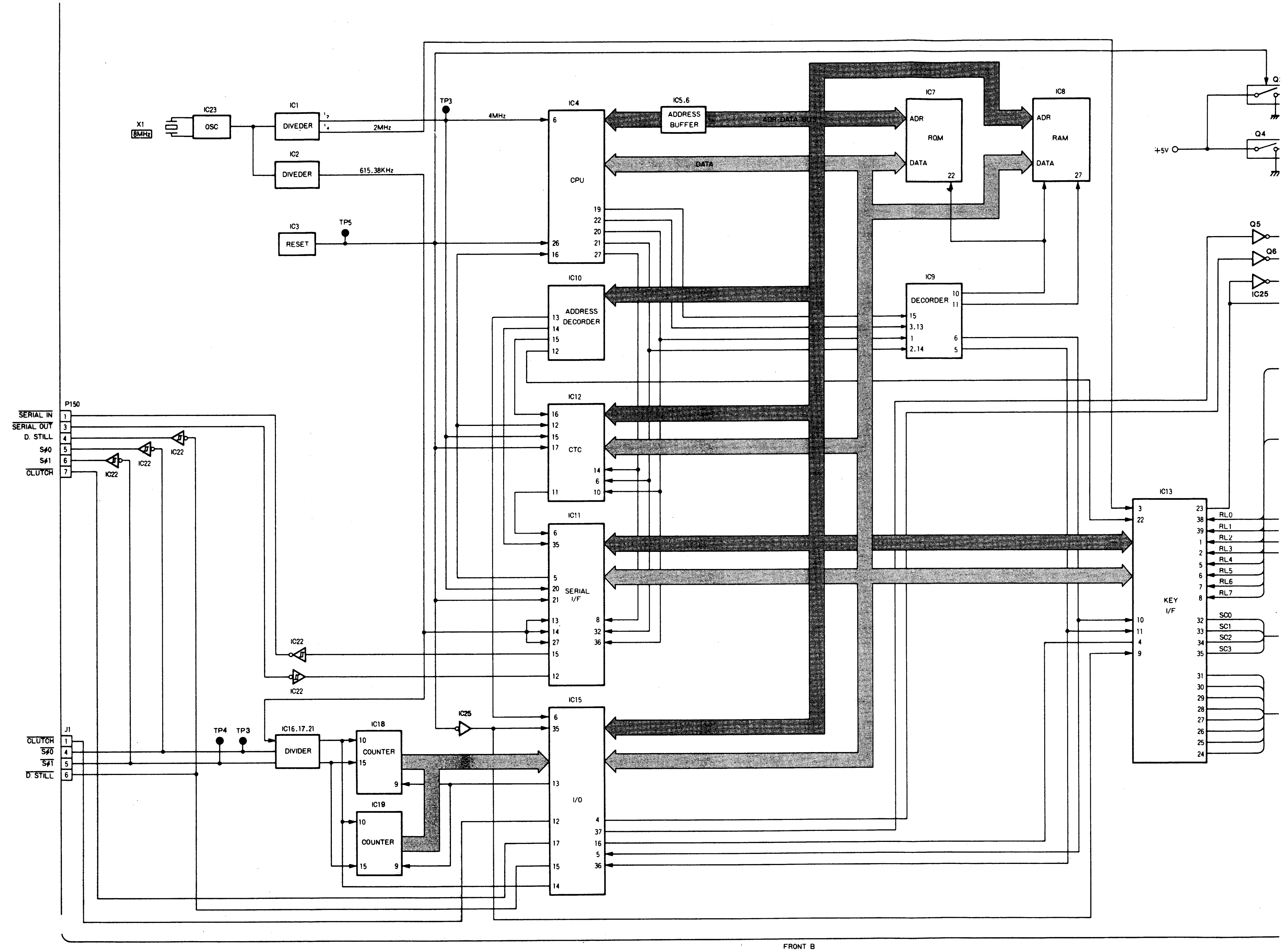
L6 SYSTEM CONTROL BLOCK DIAGRAM (2/2)



CONTROL (MAIN/VR/SW) BLOCK DIAGRAM

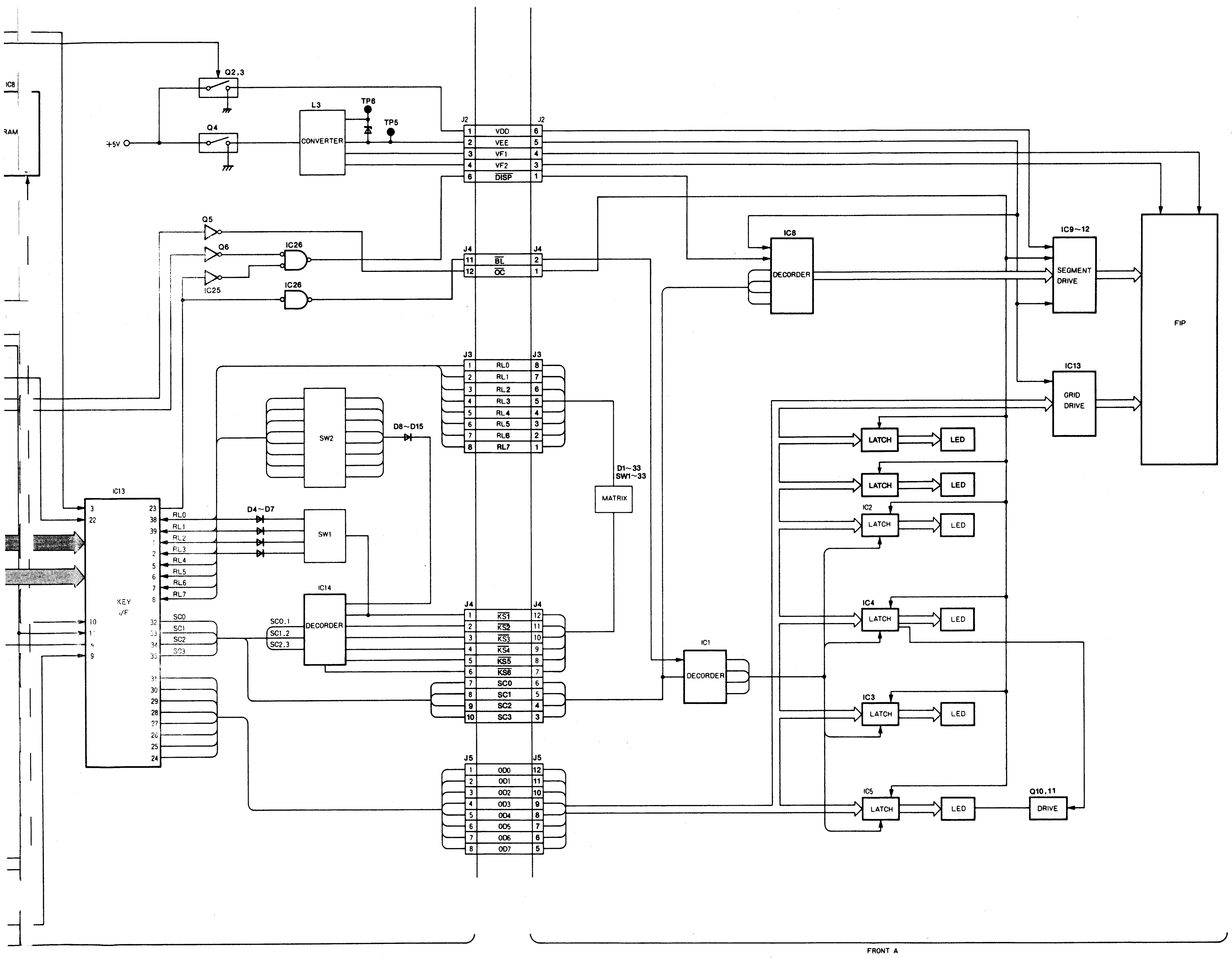


FRONT PANEL A, B BLOCK DIAGRAM



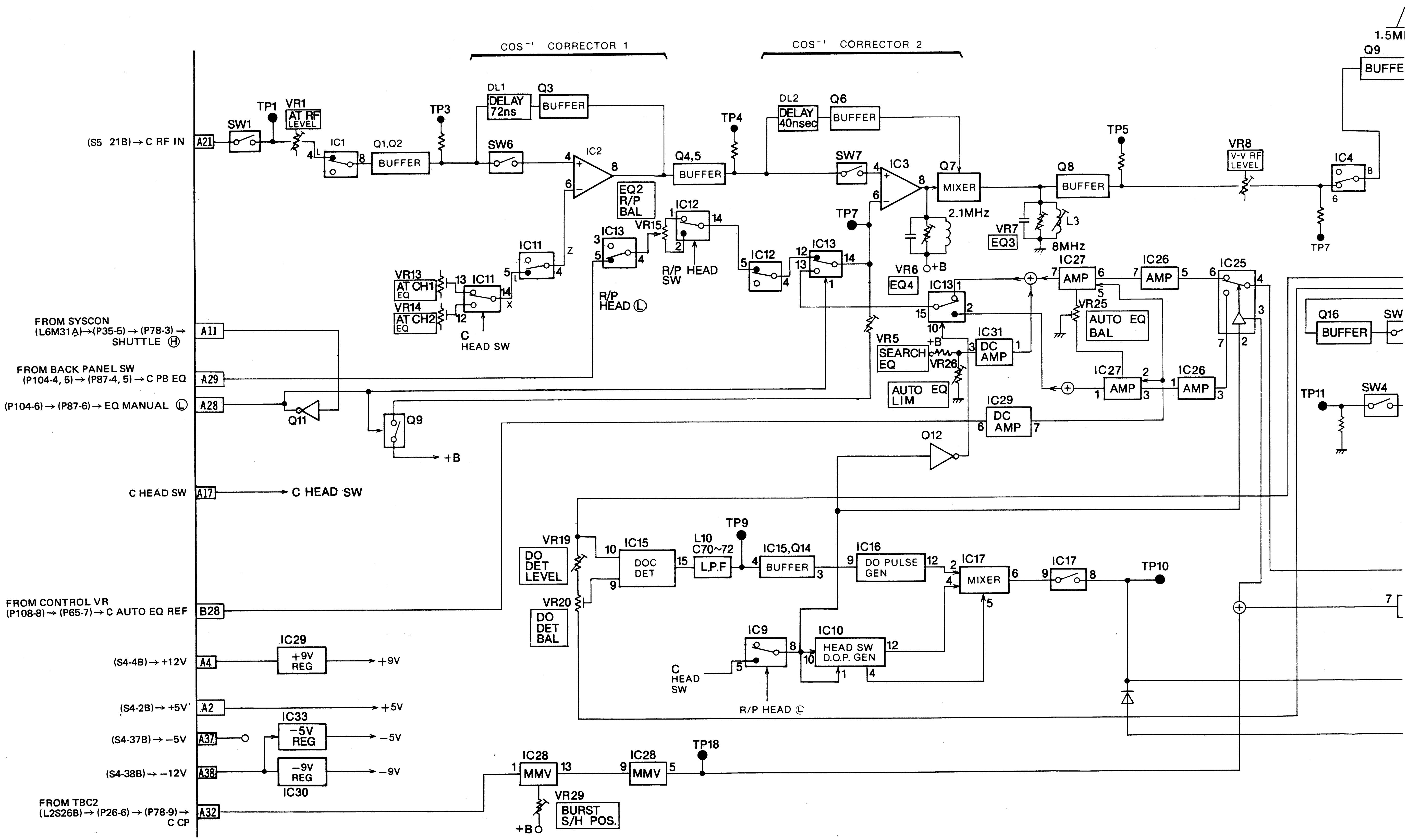
REVERSE SIDE

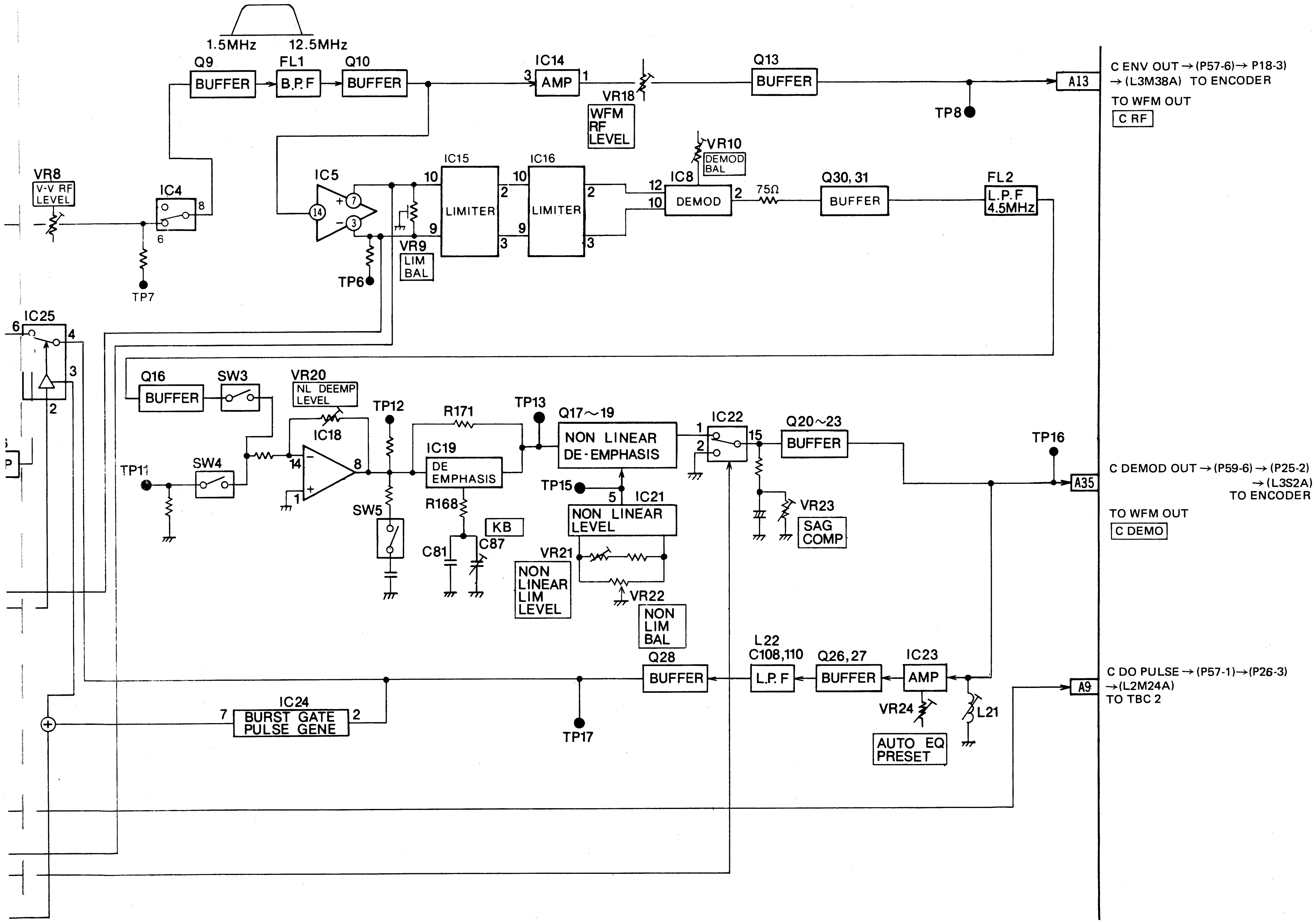
L6 SYSTEM CTL (2/2)
CONTROL (MAIN/VR/SW)



Q2,3
Q4
+5V
L3
CONVERTER
TP6
TP5
J2
VDD
VEE
VF1
VF2
DISP
Q5
Q6
IC26
IC25
J4
BL
OC
IC8
DECORDER
IC9~12
SEGMENT DRIVE
FIP
IC13
GRID DRIVE
J3
RL0
RL1
RL2
RL3
RL4
RL5
RL6
RL7
SW2
D8~D15
D1~33
SW1~33
MATRIX
D4~D7
SW1
IC14
DECORDER
SC0,1
SC1,2
SC2,3
KEY I/F
KS1
KS2
KS3
KS4
KS5
KS6
SC0
SC1
SC2
SC3
IC1
DECORDER
LATCH
LED
IC2
IC4
IC3
IC5
Q10,11
DRIVE
J5
OD0
OD1
OD2
OD3
OD4
OD5
OD6
OD7
FRONT A

S3 C PLAYBACK BLOCK DIAGRAM





S-3	C PLAYBACK			
B		NO	A	
	—	1	GND	S4-1B
POWER5-7	—	2	+5V	S4-2B
	—	3	+12V	S4-3B
	—	4	+12V	S4-4B
		5	+24V	S4-5B
	—	6	GND	
		7		
	—	8	GND	
S5-24B	—	9	C DO PULSE	P57-1 S9-35B
	—	10	GND	P57-2
	—	11	SHUTTLE Ⓗ	P78-3
	—	12	GND	P57-5
	—	13	C ENV OUT	P57-6
	—	14	GND	
		15		
	—	16	GND	S5-19A
	—	17	C HEAD SW	S5-19B
		18		
		19		
	—	20	GND	S5-21A
	—	21	C RF IN	S5-21B
		22		
		23		
		24		
		25		
		26		
		27		
P65-7	C AUTO EQ REF	28	EQ MANUAL Ⓛ	P87-6 S4-11A
		29	C PB EQ	P87-4, 5
		30		
		31		
	—	32	C CP	P78-9
		33		
		34	GND	
	—	35	C DEMOD OUT	P59-6
	—	36	GND	P59-5
	—	37	−5V	S4-37B
POWER5-1	—	38	−12V	S4-38B
	—	39	GND	S4-39B
	—	40	GND	S4-40B

To LØ

P57			
S3–9	1	C DO PULSE	P26–3
S3–10	2	GND	P26–4
S4–9	3	Y DO PULSE	P26–1
S4–10	4	GND	P26–2
S3–12	5	GND	P18–4
S3–13	6	C ENV OUT	P18–3
S4–12	7	GND	P18–2
S4–13	8	Y ENV OUT	P18–1

To L0

P78			
S4-29	1	FWD SEARCH Ⓗ	P35-2
S4-30	2	REW SEARCH Ⓗ	P35-3
S3-11	3	SHUTTLE Ⓗ	P35-5
S6-21B	4	$\overline{\text{LOADING MUT}}$	P35-9
	5		
S10-18B	6	T BRK SOL Ⓗ	P35-6
P72-2	7	FAN STOP Ⓛ	P35-10
S4-32	8	Y AGC CP	P26-5
S3-32	9	C CP	P26-6
S6-15A	10	CUE Ⓗ	P32-3

To L0

P59			
	1		
S6-22B	2	NR ON Ⓛ	P32-10
	3		
	4		
S3-36	5	GND	P25-1
S3-35	6	C DEMOD OUT 1	P25-2
S4-36	7	GND	P25-3
S4-35	8	Y DEMOD OUT 1	P25-4

To BACK PANEL SW

P87			
S4-27	1	Y PB EQ	P104-1
S4-27	2	Y PB EQ	P104-2
S4-26	3	GND	P104-3
S3-29A	4	C PB EQ	P104-4
S3-29A	5	C PB EQ	P104-5
S3-28A	6	EQ MANUAL Ⓛ	P104-6
	7		
S6-34A	8	EXT NR Ⓛ	P104-8

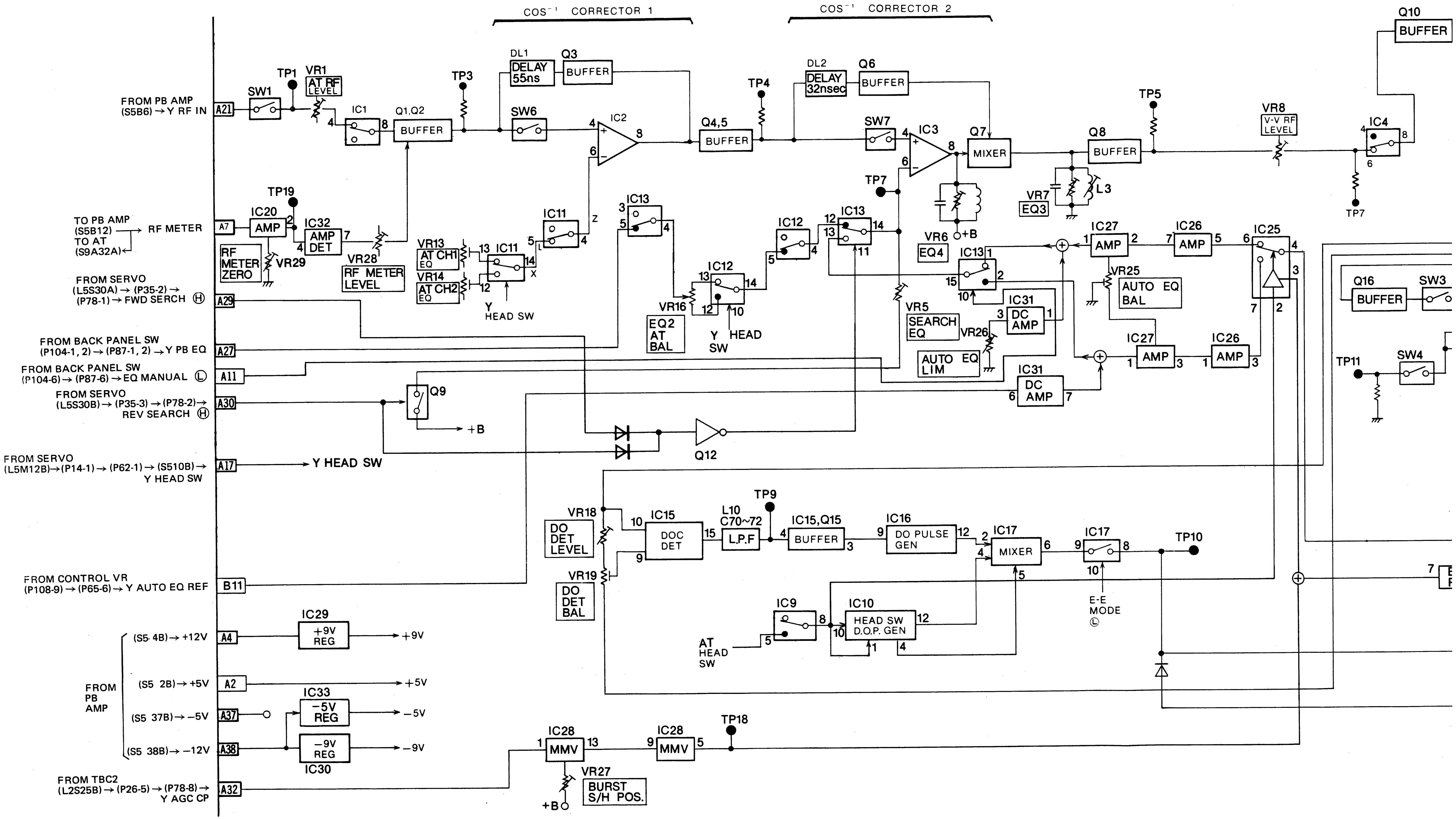
To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	−5V	P106-5
S10-37	4	−12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	−12V	P151-2

To L0

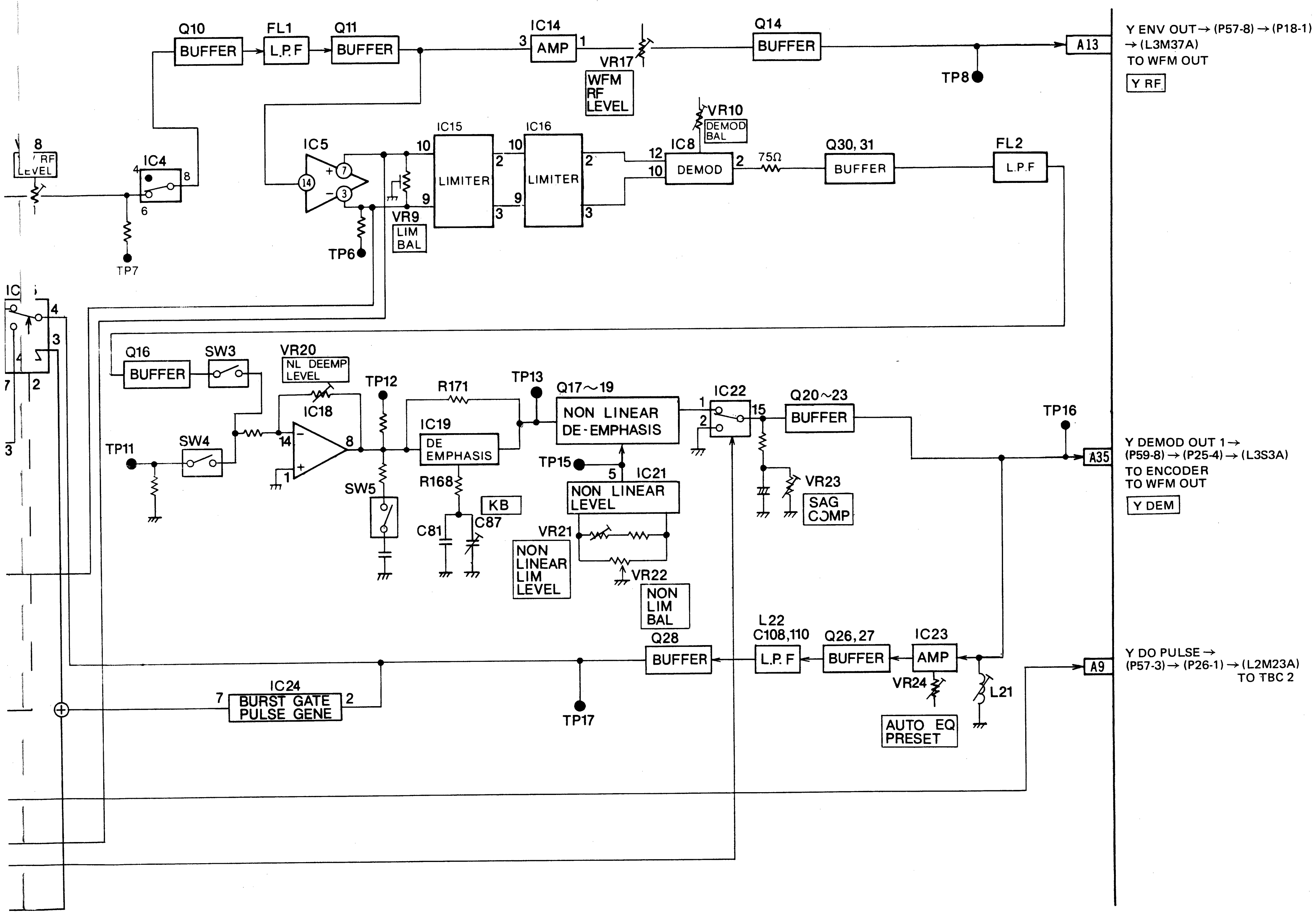
POWER 5			
S3-38B	1	−12V	POWER2-1
S10-36AB	2	−5V	POWER2-2
	3	GND	POWER2-3
	4	GND	POWER2-4
S10-4B	5	+12V	POWER2-5
	6		
S3-2B	7	+15V	POWER2-7

S4 Y PLAYBACK BLOCK DIAGRAM



REVERSE SIDE

S3 C PLAYBACK



S-4		Y PLAYBACK			
B		NO	A		
S3-1A	—	1	GND	S5-1B	
S3-2A	—	2	+5V	S5-2B	
S3-3A	—	3	+12V	S5-3B	
S3-4A	—	4	+12V	S5-4B	
S3-5A	—	5	+24V	S5-5B	
	GND	6	GND		
	—	7	Y RF METER	S9-32A	S5-12B
	—	8	GND		
	—	9	Y DO PULSE	P57-3	S9-35A
	—	10	GND	P57-4	
P65-6	Y AUTO EQ REF	11	EQ MANUAL Ⓛ	S3-28A	
	—	12	GND	P57-7	
	—	13	Y ENV OUT	P57-8	
	—	14	GND		
		15			
	—	16	GND	S5-10A	
	—	17	Y HEAD SW	S5-10B	
		18			
		19			
	—	20	GND	S5-6A	
	—	21	Y RF IN	S5-6B	
		22			
		23			
		24			
		25			
	—	26	GND	P87-3	
	—	27	Y PB EQ	P87-1, 2	
		28			
	—	29	FWD SEARCH Ⓗ	P78-1	
	—	30	REV SEARCH Ⓗ	P78-2	
		31			
	—	32	Y AGC CP	P78-8	
		33			
		34			
P59-8	—	35	Y DEMOD OUT 1		
P59-7	—	36	GND		
S3-37A	—	37	−5V	S5-37B	
S3-38A	—	38	−12V	S5-38B	
S3-39A	—	39	GND	S5-39B	
S3-40A	—	40	GND	S5-40B	

To LØ

P57			
S3−9	1	C DO PULSE	P26−3
S3−10	2	GND	P26−4
S4−9	3	Y DO PULSE	P26−1
S4−10	4	GND	P26−2
S3−12	5	GND	P18−4
S3−13	6	C ENV OUT	P18−3
S4−12	7	GND	P18−2
S4−13	8	Y ENV OUT	P18−1

To L0

P78			
S4-29	1	FWD SEARCH Ⓗ	P35-2
S4-30	2	REW SEARCH Ⓗ	P35-3
S3-11	3	SHUTTLE Ⓗ	P35-5
S6-21B	4	$\overline{\text{LOADING MUT}}$	P35-9
	5		
S10-18B	6	T BRK SOL Ⓗ	P35-6
P72-2	7	FAN STOP Ⓛ	P35-10
S4-32	8	Y AGC CP	P26-5
S3-32	9	C CP	P26-6
S6-15A	10	CUE Ⓗ	P32-3

To L0

P59			
	1		
S6-22B	2	NR ON Ⓛ	P32-10
	3		
	4		
S3-36	5	GND	P25-1
S3-35	6	C DEMOD OUT 1	P25-2
S4-36	7	GND	P25-3
S4-35	8	Y DEMOD OUT 1	P25-4

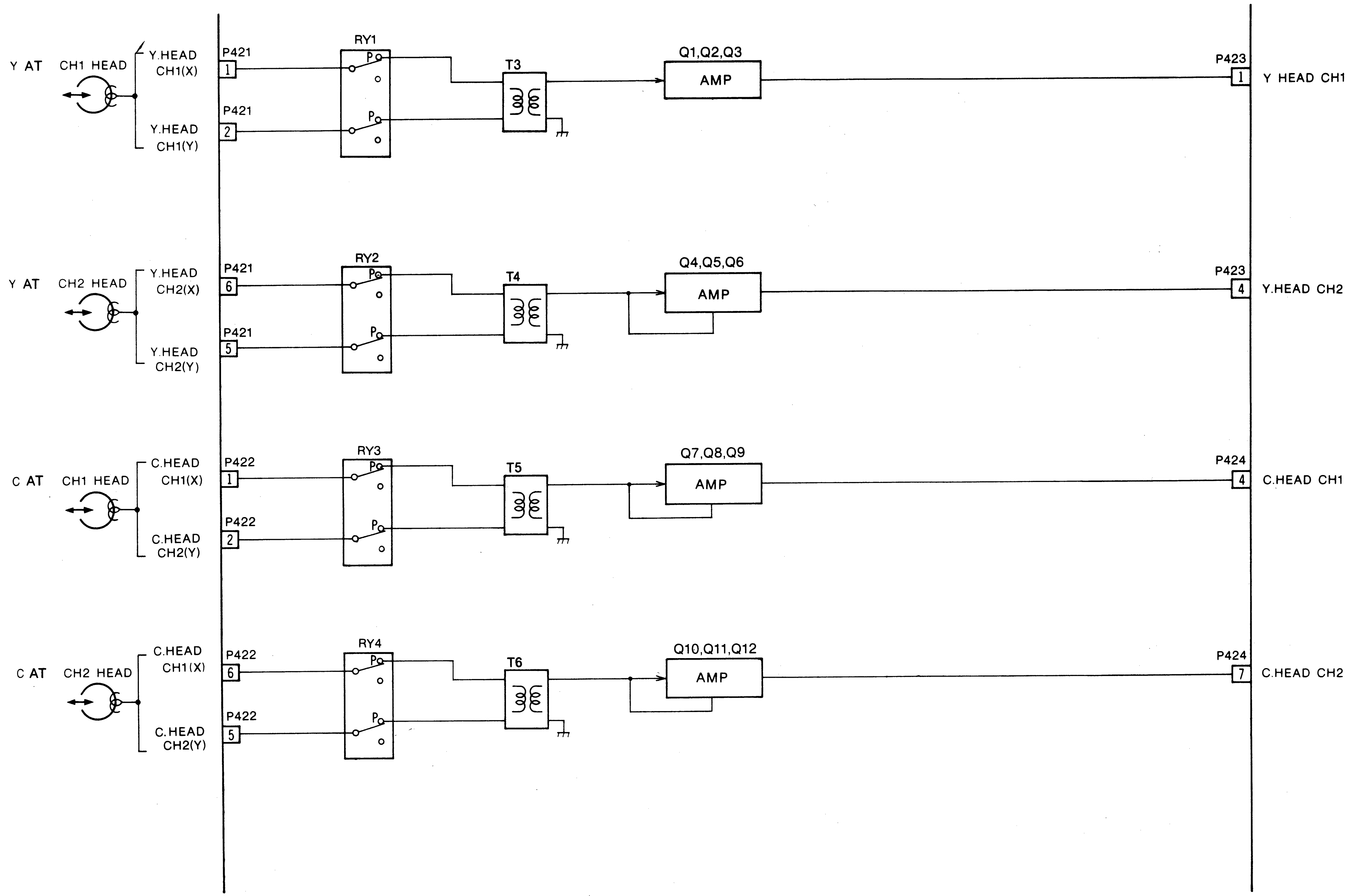
To BACK PANEL SW

P87			
S4-27	1	Y PB EQ	P104-1
S4-27	2	Y PB EQ	P104-2
S4-26	3	GND	P104-3
S3-29A	4	C PB EQ	P104-4
S3-29A	5	C PB EQ	P104-5
S3-28A	6	EQ MANUAL Ⓛ	P104-6
	7		
S6-34A	8	EXT NR Ⓛ	P104-8

To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	−5V	P106-5
S10-37	4	−12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	−12V	P151-2

AT HEAD AMP BLOCK DIAGRAM



S5 PB AMP BLOCK I

(HEAD AMP)
P423-1 ← P6

L5-M12B ← P14-1 ← P62-

S4-1

P423-4 ← P6
(HEAD AMP)

(HEAD AMP)
P424-4 ← P6(

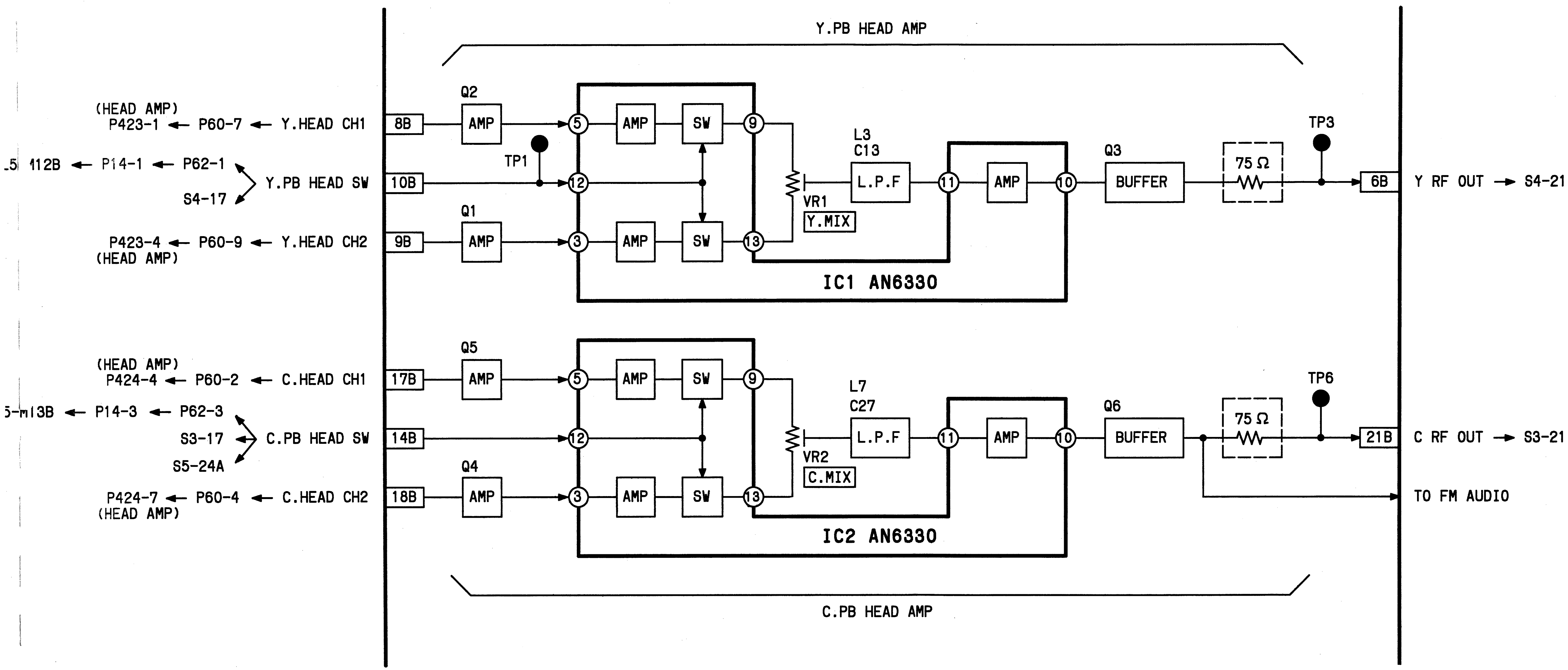
L5-M13B ← P14-3 ← P62-

S3-1'

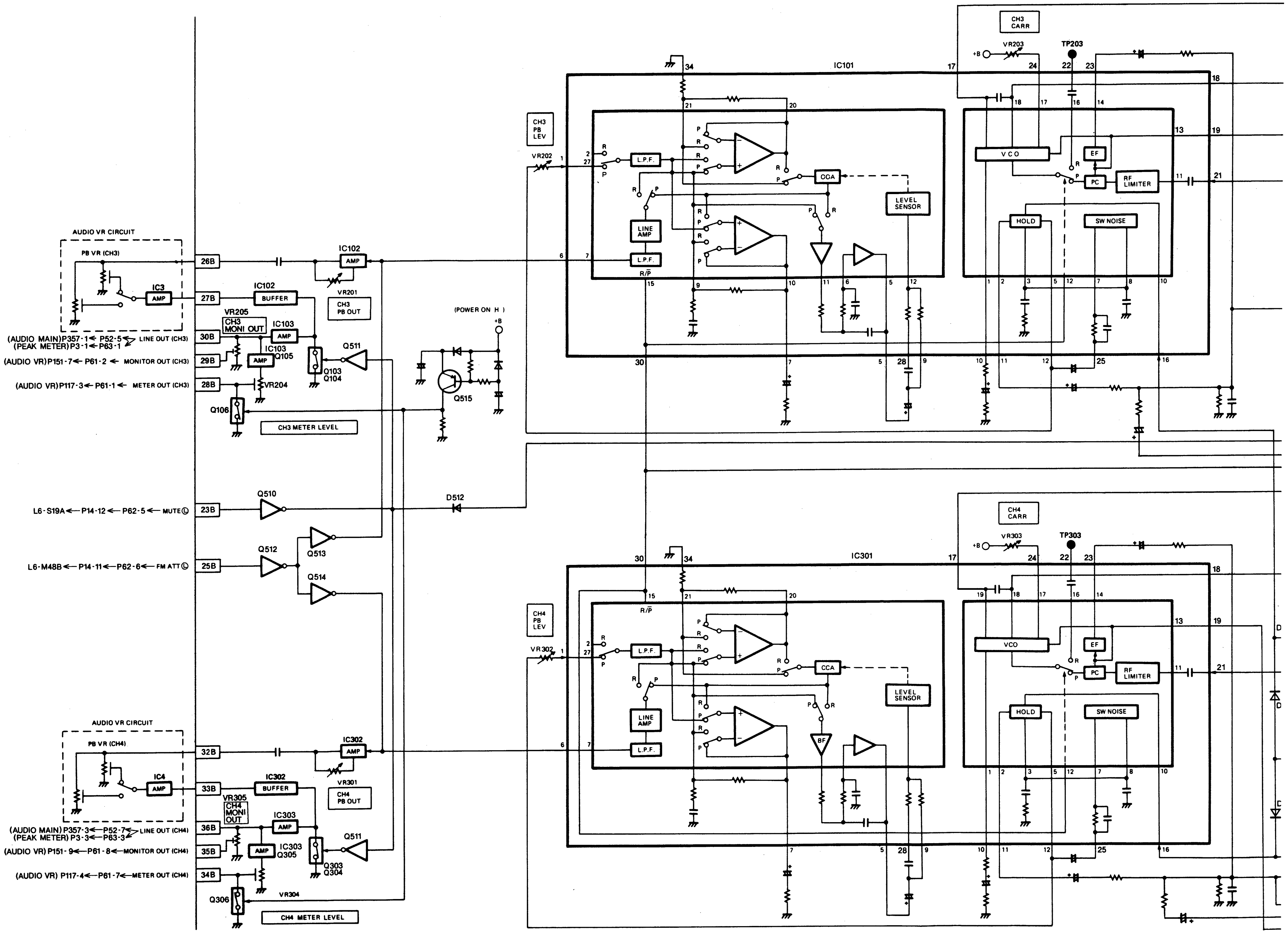
S5-24.

P424-7 ← P6(
(HEAD AMP)

PB AMP BLOCK DIAGRAM

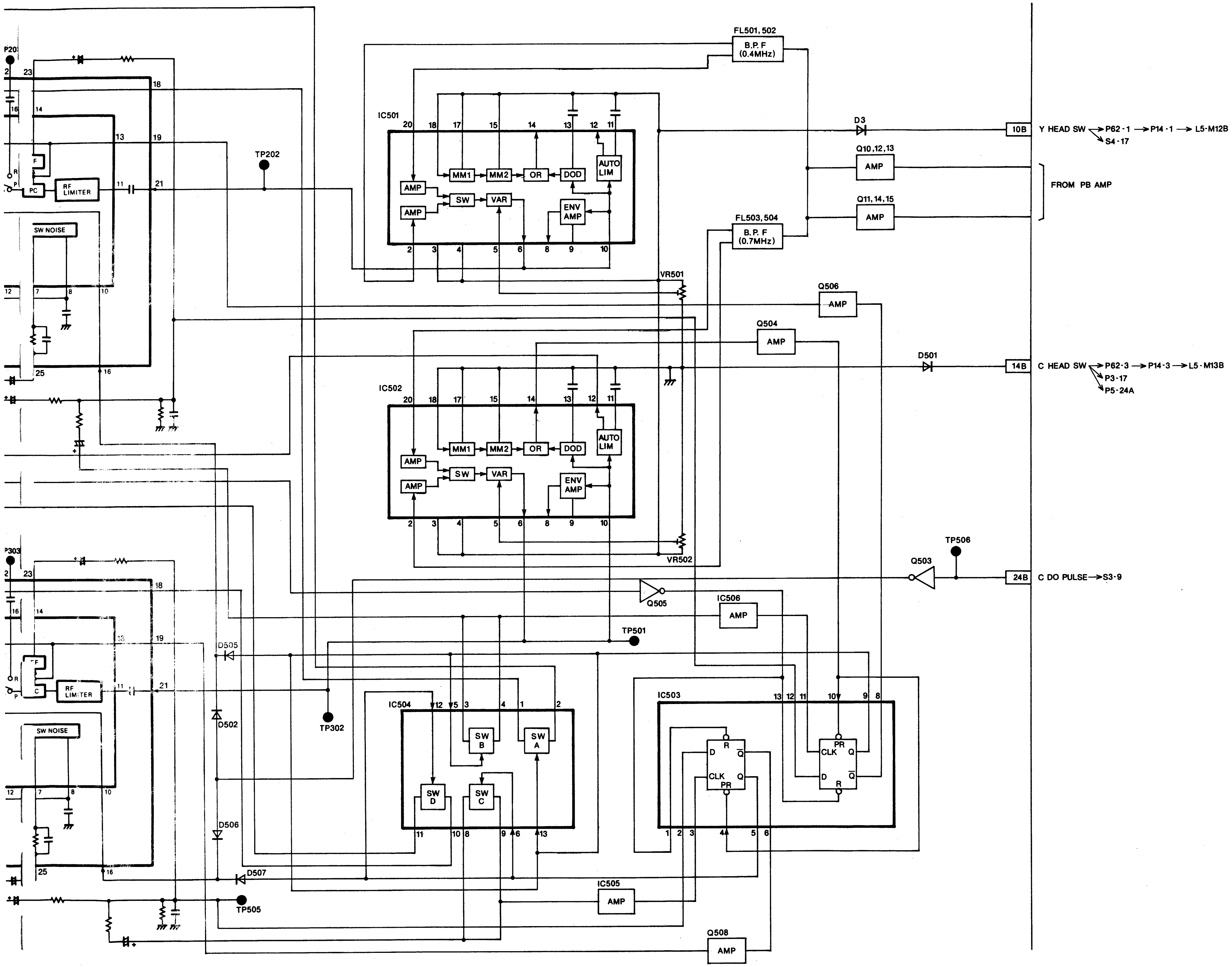


S5 FM AUDIO BLOCK DIAGRAM

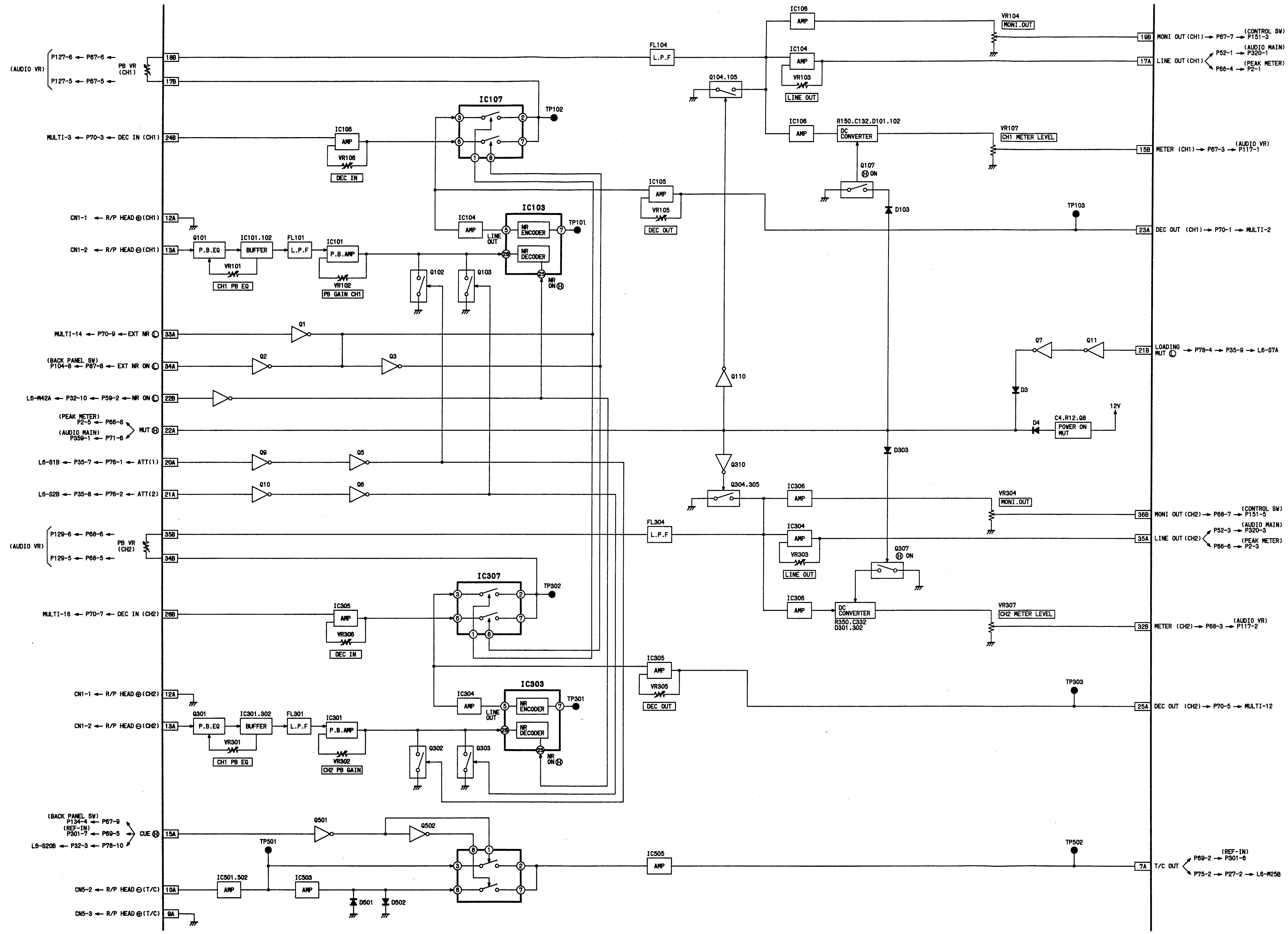


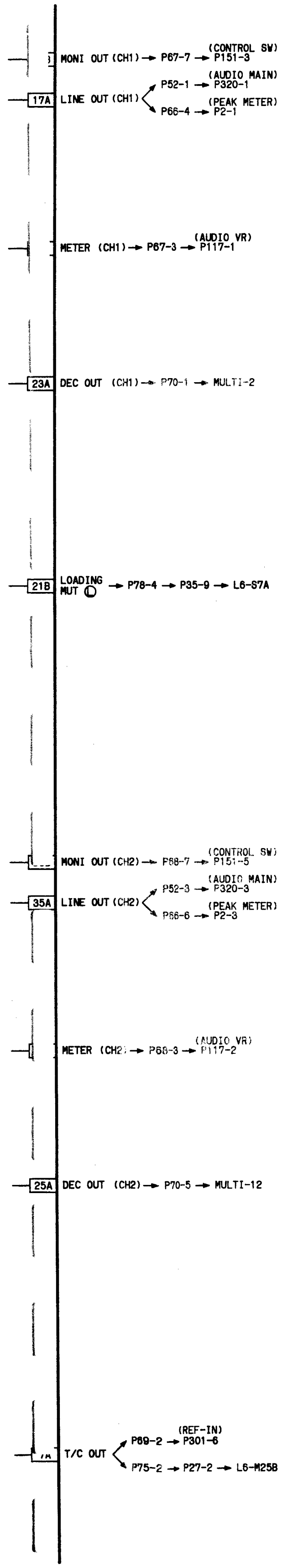
REVERSE SIDE

AT HEAD AMP
S5 PB AMP

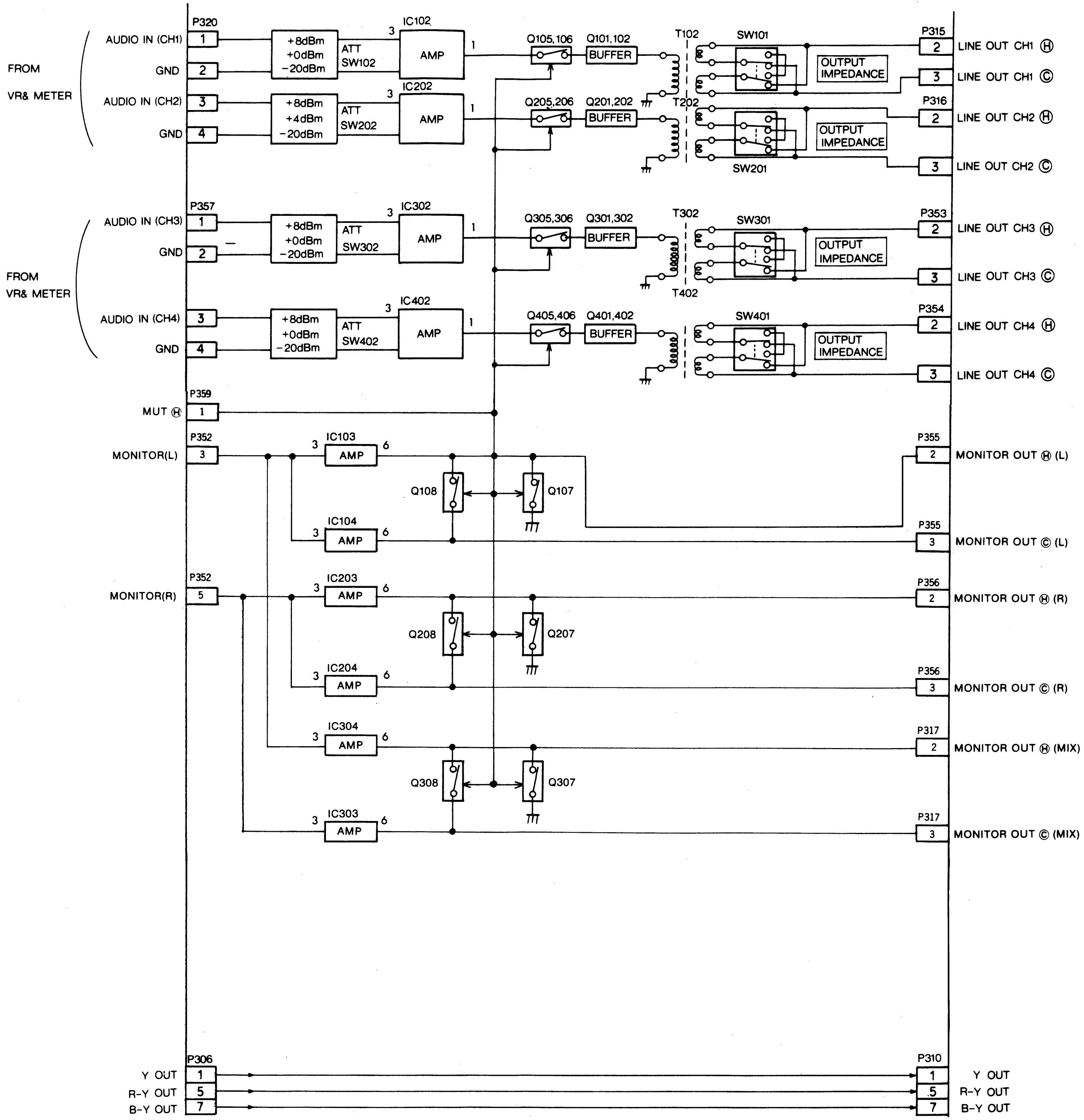

FL501, 502
B.P.F (0.4MHz)
IC501
AMP
MM1
MM2
OR
DOD
AUTO LIM
SW
VAR
ENV AMP
D3
10B
Y HEAD SW → P62-1 → P14-1 → L5-M12B
S4-17
Q10, 12, 13
AMP
FROM PB AMP
Q11, 14, 15
AMP
FL503, 504
B.P.F (0.7MHz)
TP202
RF LIMITER
PC
SW NOISE
VR501
Q506
AMP
Q504
AMP
D501
14B
C HEAD SW → P62-3 → P14-3 → L5-M13B
P3-17
P5-24A
IC502
VR502
TP506
Q503
24B
C DO PULSE → S3-9
Q505
IC506
AMP
TP501
D505
D502
TP302
IC504
SW B
SW A
SW D
SW C
IC503
CLK
PR
D506
D507
TP505
IC505
AMP
Q508
AMP

S6 AUDIO BLOCK DIAGRAM

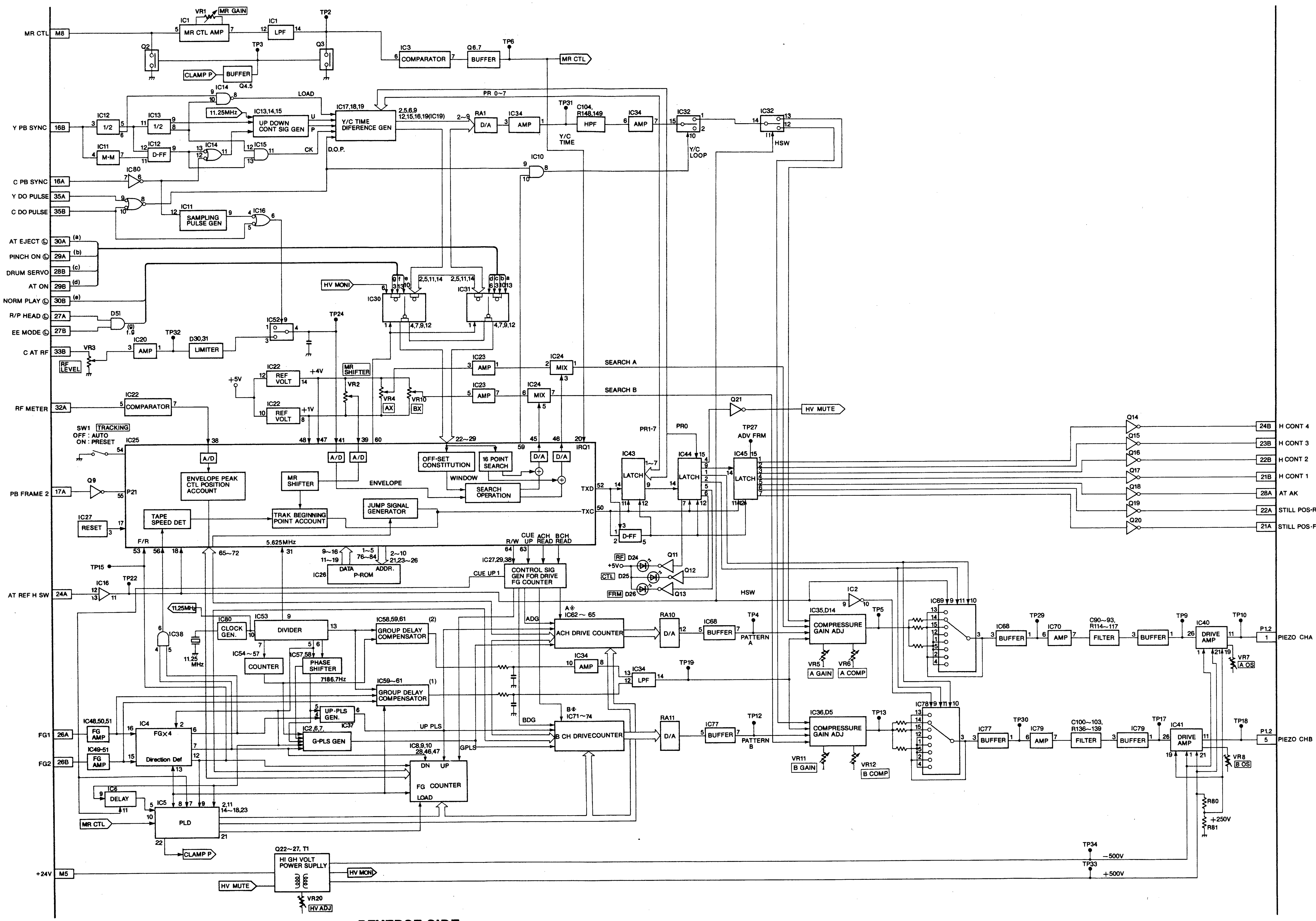




AUDIO MAIN BLOCK DIAGRAM

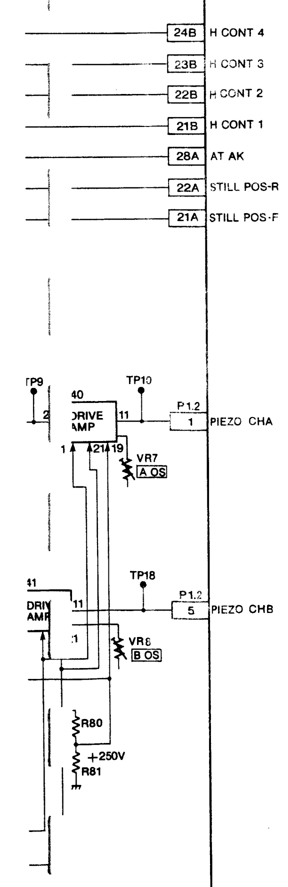


S9 AUTO TRACKING BLOCK DIAGRAM



REVERSE SIDE

S6 AUDIO
AUDIO MAIN



S-9			AT	
B		NO	A	
S5-1A	–	1	GND	
S6-2A	–	2	+5V	S10-3B
S6-3A	–	3	+12V	S10-5B
S6-4A	–	4	+12V	S10-5B
S6-5A	–	5	+24V	S10-6B
	–	6	UNREG GND	S10-24
	–	7		
P64-1	–	8	MR CTL	
P64-2	–	9	GND	
		10		
		11		
		12		
		13		
		14		
P64-9,11	–	15	GND	
P64-10	Y PB SYNC	16	C PB SYNC	P64-12
		17	PB FRAME 2	P64-8
		18		
		19		
		20		
P77-1	HCONT 1	21	STILL POS-F	P74-3
P77-2	HCONT 2	22	STILL POS-R	P74-4
P77-3	HCONT 3	23		
P77-4	HCONT 4	24	AT REF H SW	P64-6
P64-5	–	25	GND	P64-7
P64-4	FG2	26	FG1	P64-3
		27		
P77-5	DRUM SERVO Ⓛ	28	AT AK Ⓛ	P74-5
P74-6	AT ON Ⓛ	29	PINCH ON Ⓛ	P74-9
P74-7	NORM PLAY Ⓛ	30	AT EJECT Ⓛ	P74-8
		31		
	GND	32	C RF	S4-7A
S5-22B	–	33	C AT RF IN	S5-22A
S5-22B	–	34	GND	
S3 -9	C DO PLS	35	Y DO PLS	S4 -9A
		36		
S6-37A	–	37	–5V	S10-36B
S6-38A	–	38	–12V	S10-37B,38B
S5-39A	–	39	GND	S10-39B
S5-40A	–	40	GND	S10-40B

To L0

P64			
S9-8	1	MR CTL	P28-1
S9-9	2	GND	P28-2
S9-26A	3	FG1	P22-1
S9-26B	4	FG2	P22-2
S9-25B	5	GND	P22-3
S9-24A	6	REF H SW	P14-5
S9-25A	7	GND	P14-6
S9-17A	8	PB FRAME 2	P26-7
S9-15	9	GND	P26-10
S9-16B	10	Y PB SYNC	P26-9
S9-15	11	GND	P26-12
S9-16A	12	C PB SYNC	P26-11

To L0

P74			
	1		
	2		
S9-21A	3	STILL POS F	P31-3
S9-22A	4	STILL POS R	P31-4
S9-28A	5	AT AK	P31-5
S9-29B	6	AT ON	P31-6
S9-30B	7	NORMAL PLAY	P31-7
S9-30A	8	AT EJECT	P31-8
S9-29A	9	PINCH ON	P31-9
	10		

To L0

P77			
S9-21B	1	H CONT 1	P34-1
S9-22B	2	H CONT 2	P34-2
S9-23B	3	H CONT 3	P34-3
S9-24B	4	H CONT 4	P34-4
S9-28B	5	DRUM SERVO	P35-1

S-10			POWER & DRIVE	
B		NO	A	
S9-1A	–	1	GND	P54-8
	–	2	GND	
S9 -2A	–	3	+5V	P54-6, 7 P65-1
POWER5-5	–	4	REG +12V Ⓛ	P73-1
S9 -3A,4A	–	5	REG +12V Ⓢ	P68-1 P71-3 P65-2
S9-5A POWER 3-1	–	6	+24V	P54-5 P73-3 P65-9
POWER4-1	–	7	+14V	
POWER4-2	–	8	+14V	
POWER4-7	–	9	+7V	
	–	10		
	–	11	S REEL MOTOR ⊕	P53-1
	–	12	S REEL MOTOR ⊖	P53-2
P76-3	S REEL MOTOR ①	13		
P76-4	S REEL MOTOR ②	14		
	–	15		
	–	16		
P76-10	PINCH SOL Ⓗ	17		
P76-6	T BRAKE SOL Ⓗ	18	S BRAKE SOL Ⓗ	P76-9
	–	19	PINCH SOL Ⓑ	P53-5
P53-7	PINCH SOL Ⓒ	20	T BRAKE SOL Ⓒ	P53-6
	–	21	T BRAKE SOL Ⓑ	P53-8
	–	22	S BRAKE SOL Ⓑ	P53-9
P53-10	S BRAKE SOL Ⓒ	23		
POWER 3-2	–	24	UNREG GND	P73-4 P75-6, 7
P76-6	LOADING 2 Ⓗ	25	LOADING 1 Ⓗ	P76-5
P76-8	LOADING 4 Ⓗ	26	LOADING 3 Ⓗ	P76-7
	–	27	ELEVATOR Ⓜ⊕	P54-1
	–	28	ELEVATOR Ⓜ⊖	P54-2
	–	29	LOADING Ⓜ⊕	P54-3
	–	30	LOADING Ⓜ⊖	P54-4
	–	31	GND (MOTOR)	
		32		
POWER4-6	–	33	–7V	
POWER4-5	–	34	–14V	
POWER4-5	–	35	–14V	
S9 –37A	–	36	–5V	POWER 5-2
S9 –38A	–	37	REG –12V	P68-2 P65-4, 10
S9 –38A	–	38	REG –12V	P71-4
S9 –39A	–	39	GND	P71-5
S9 –40A	–	40	GND	

To CHASSIS INTERMEDIATE

P53			
S10–11	1	S REEL Ⓜ⊕	P451–1
S10–12	2	S REEL Ⓜ⊖	P451–2
	3		
	4		
S10–19	5	PINCH SOL Ⓑ	P451–5
S10–20A	6	T BRAKE SOL Ⓒ	P451–6
S10–20B	7	PINCH SOL Ⓒ	P451–7
S10–21	8	T BRAKE SOL Ⓑ	P451–8
S10–22	9	S BRAKE SOL Ⓑ	P451–9
S10–23B	10	S BRAKE SOL Ⓒ	P451–10

To CHASSIS INTERMADIATE

P54			
S10–27	1	ELEVATOR Ⓜ⊕	P406–4
S10–28	2	ELEVATOR Ⓜ⊖	P406–5
S10–29	3	LOADING Ⓜ⊕	P452–1
S10–30	4	LOADING Ⓜ⊖	P452–2
S10–6	5	+24V	P452–3
S10–3	6	+5V	P452–4
S10–3	7	+5V	P452–5
S10–1	8	GND	P452–6

To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	–5V	P106-5
S10-37	4	–12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	–12V	P151-2

To AUDIO VR
To CONTROL SW
To AUTO OFF LED

P68			
S10-5	1	+12V	P152-1
S10-37	2	–12V	P152-3
S6-32B	3	METER (CH2)	P117-2
S6-33B	4	(GND)	P129-7
S6-34B	5	PB VR ⊕ (CH2)	P129-5
S6-35B	6	PB VR ⊖ (CH2)	P129-6
S6-36B	7	MONI OUT (CH2)	P151-5
S6-39B	8	GND	P151-6
S6-1	9	GND	P112-4
S6-1	10	GND	P152-2

P71			
POWER3-1	1	+24V	P331–1
POWER3-2	2		P331–3
S10–5	3	+14	P359–2
S10–38	4	–14	P359–3
S10–39	5	GND	P359–4
S6 –22A	6	MUT Ⓗ	P359–1

To AUDIO MAIN

POWER 3			
S10-6	1	+24V	P211–1
S10-24	2		P211–2

To POWER BOX

P72			
POWER3-1	1	+24V	P212–1
P78-7	2	FAN STOP Ⓛ	P212–2
POWER3-2	3		P212–3

To POWER BOX

P73			
S5–13A	1	REC PCM Y	MULTI-1
S5–13B	2	GND	MULTI-2
S5–34A	3	REC PCM C	MULTI-4
S5–34B	4	GND	MULTI-3

(To MIC JACK)

To L0 (L6)

P75			
S6-6A	1	(T/C GND)	P27-1
S6-7A	2	T/C CUE OUT	P27-2
S6-3	3	S+12V	P32-5
S6-5	4	+24V	P32-6
S6-7B	5	(T/C GND)	P27-3
S9-6AB	6	UNREG GND	P32-8
S9-6AB	7	UNREG GND	P32-9
S6-5	8	+24V	P32-7

To L0

P76			
S6-20A	1	ATT (1)	P35-7
S6-21A	2	ATT (2)	P35-8
S10-13B	3	S REEL MOTOR ①	P33-3
S10-14B	4	S REEL MOTOR ②	P33-4
S10-25A	5	LOADING 1 Ⓗ	P33-5
S10-25B	6	LOADING 2 Ⓗ	P33-6
S10-26A	7	LOADING 3 Ⓗ	P33-7
S10-26B	8	LOADING 4 Ⓗ	P33-8
S10-18A	9	S BRK SOL Ⓗ	P33-9
S10-17B	10	PINCH SOL Ⓗ	P33-10

To L0

P78			
S4-29	1	FWD SEARCH Ⓗ	P35-2
S4-30	2	REW SEARCH Ⓗ	P35-3
S3-11	3	SHUTTLE Ⓗ	P35-5
S6-21B	4	LOADING MUT	P35-9
	5		
S10-18B	6	T BRK SOL Ⓗ	P35-6
P72-2	7	FAN STOP Ⓛ	P35-10
S4-32	8	Y AGC CP	P26-5
S3-32	9	C CP	P26-6
S6-15A	10	CUE Ⓗ	P32-3

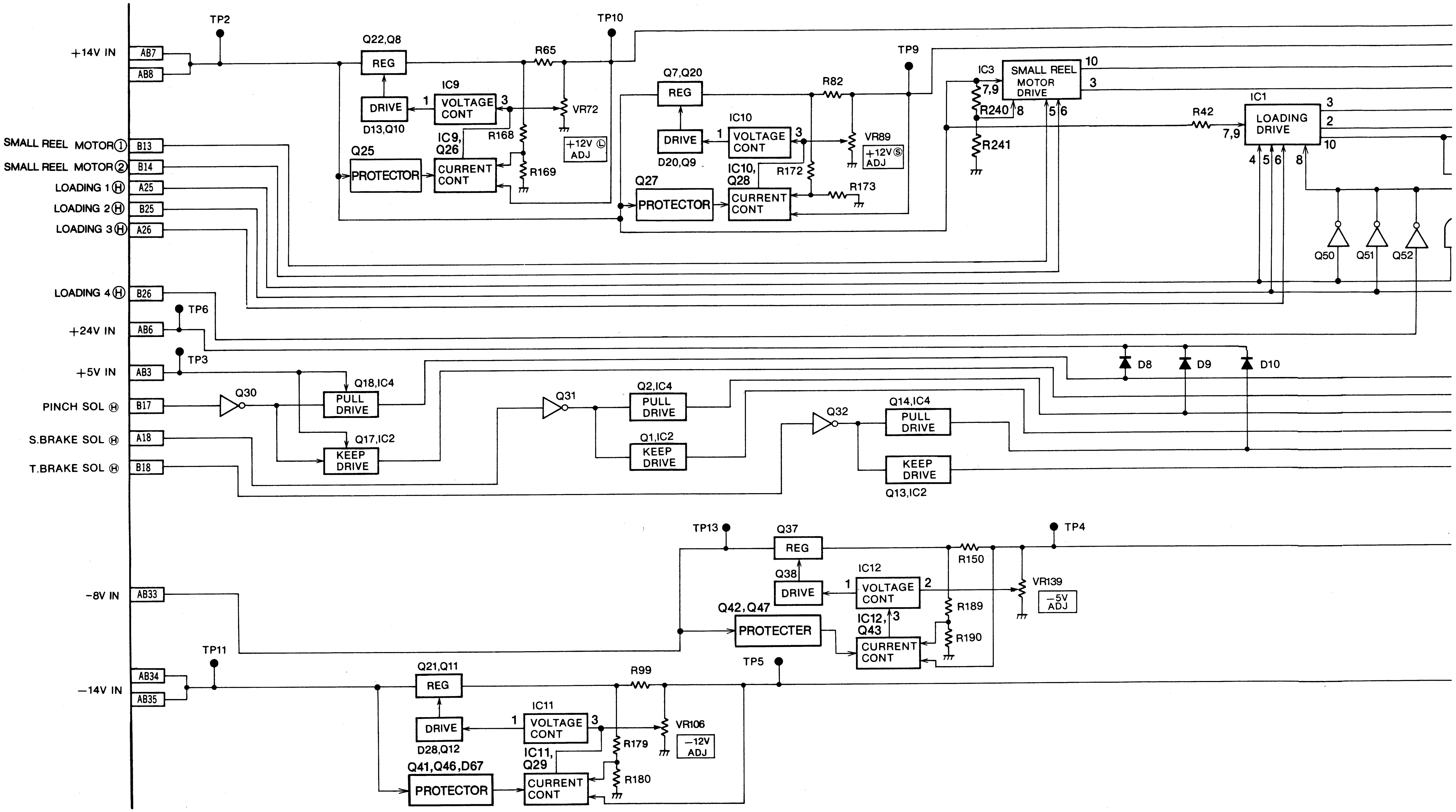
POWER 4			
S10–7	1	+14V	P213–1
S10–8	2	+14V	P213–2
	3	GND	P213–3
	4	GND	P213–4
S10–34,35	5	–14V	P213–5
S10–33	6	–7V	P214–6
S10–9	7	+7V	P214–7

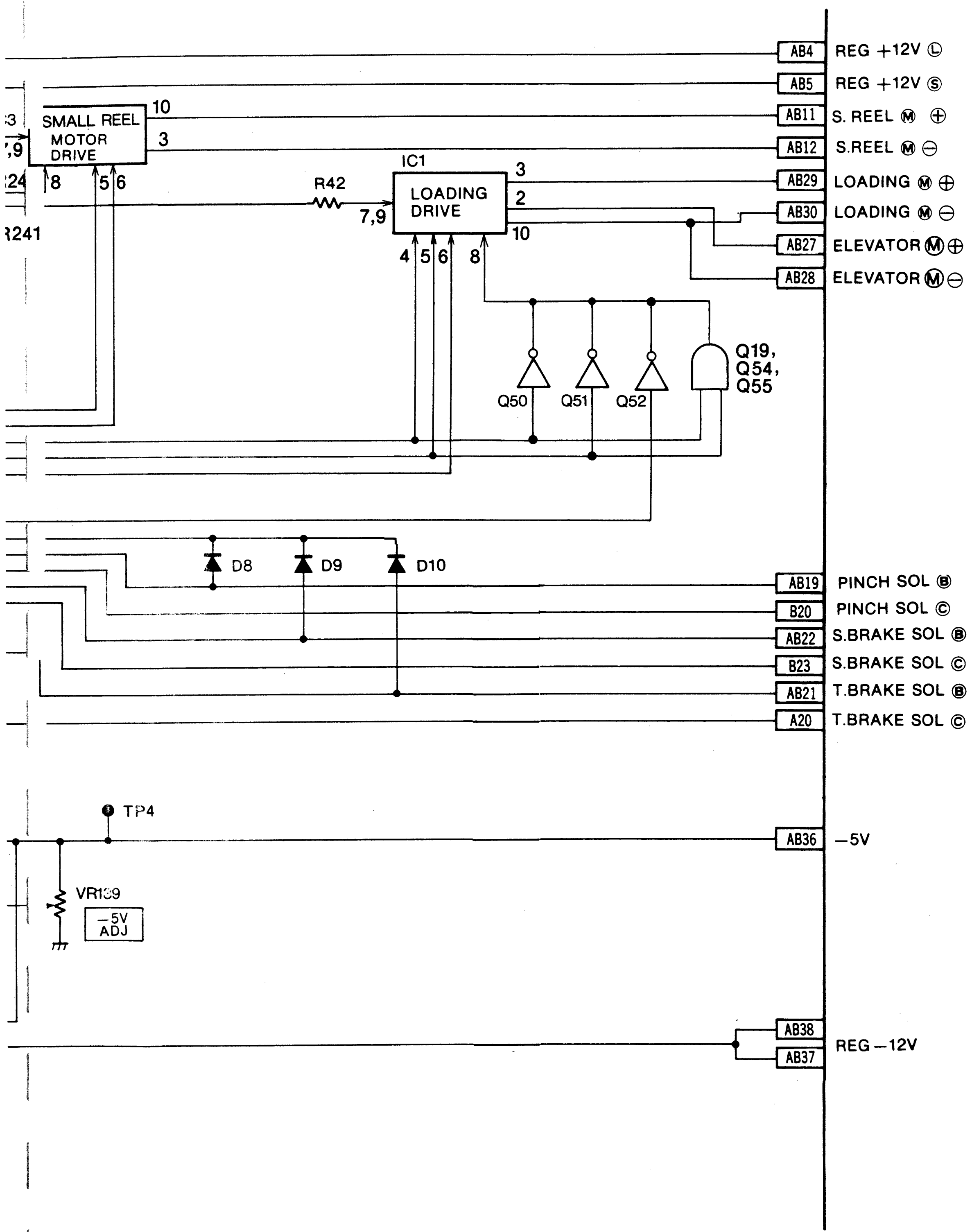
To POWER BOX

To L0

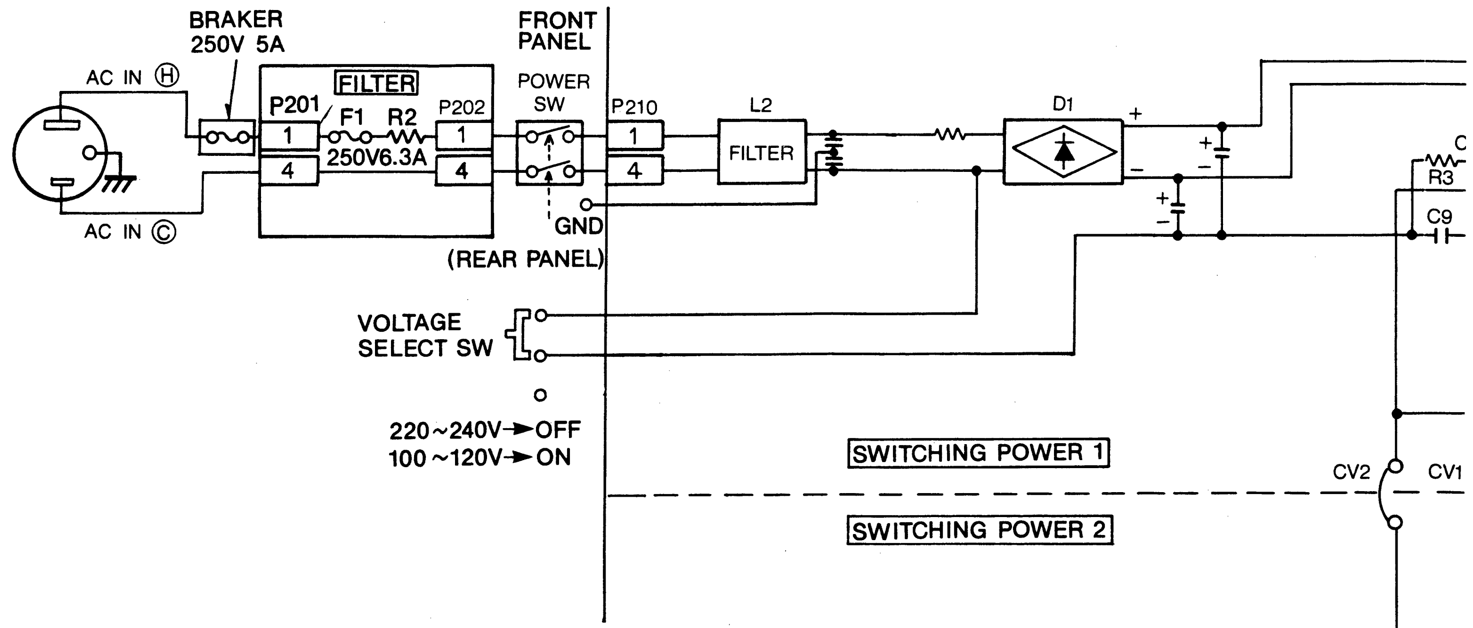
POWER 5			
S3-38B	1	–12V	POWER2-1
S10-36AB	2	–5V	POWER2-2
	3	GND	POWER2-3
	4	GND	POWER2-4
S10-4B	5	+12V	POWER2-5
	6		
S3-2B	7	+15V	POWER2-7

S10 POWER DRIVE BLOCK DIAGRAM

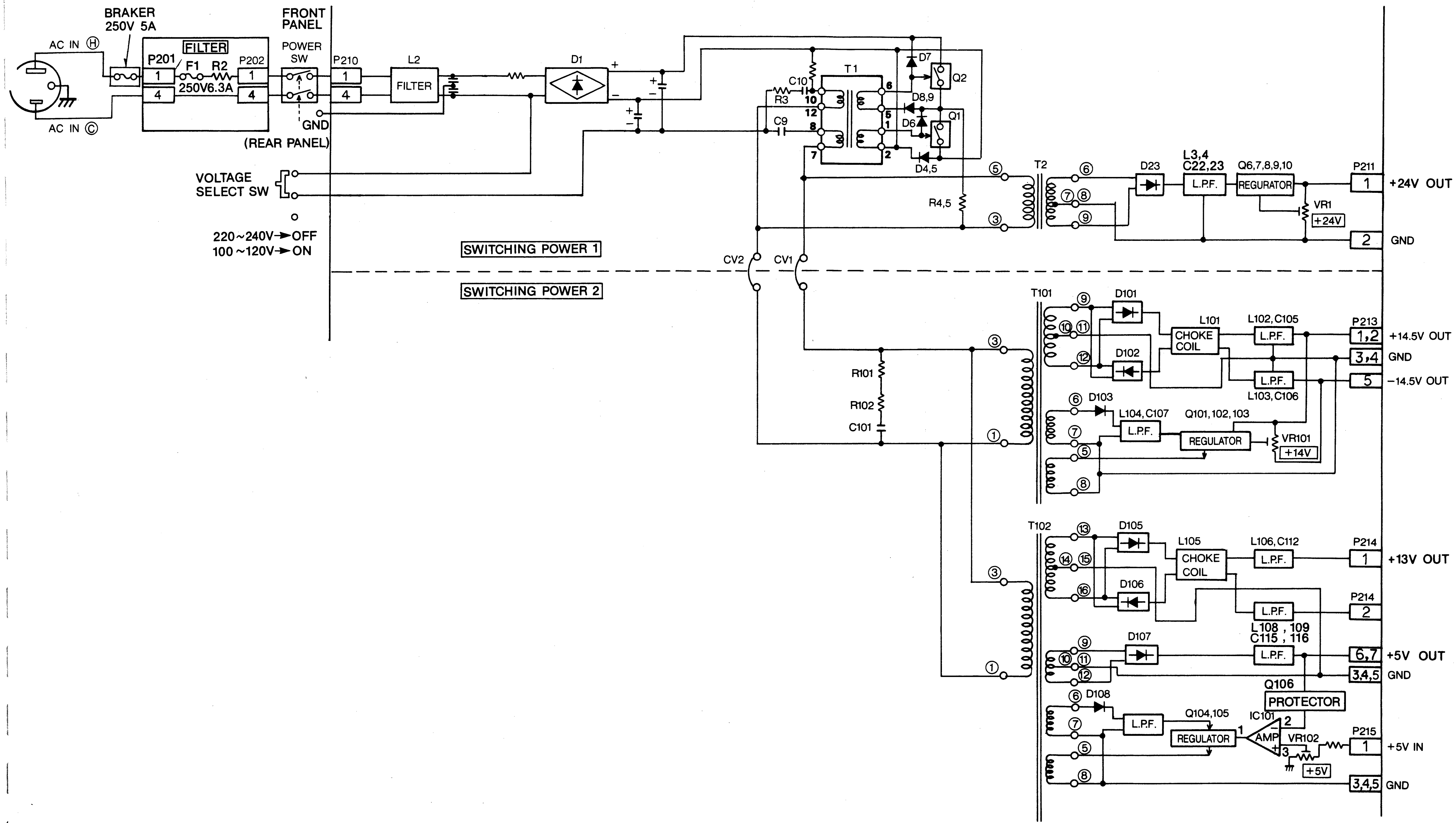




SWITCHING POWER 1, 2 BLOCK DIAGRAM



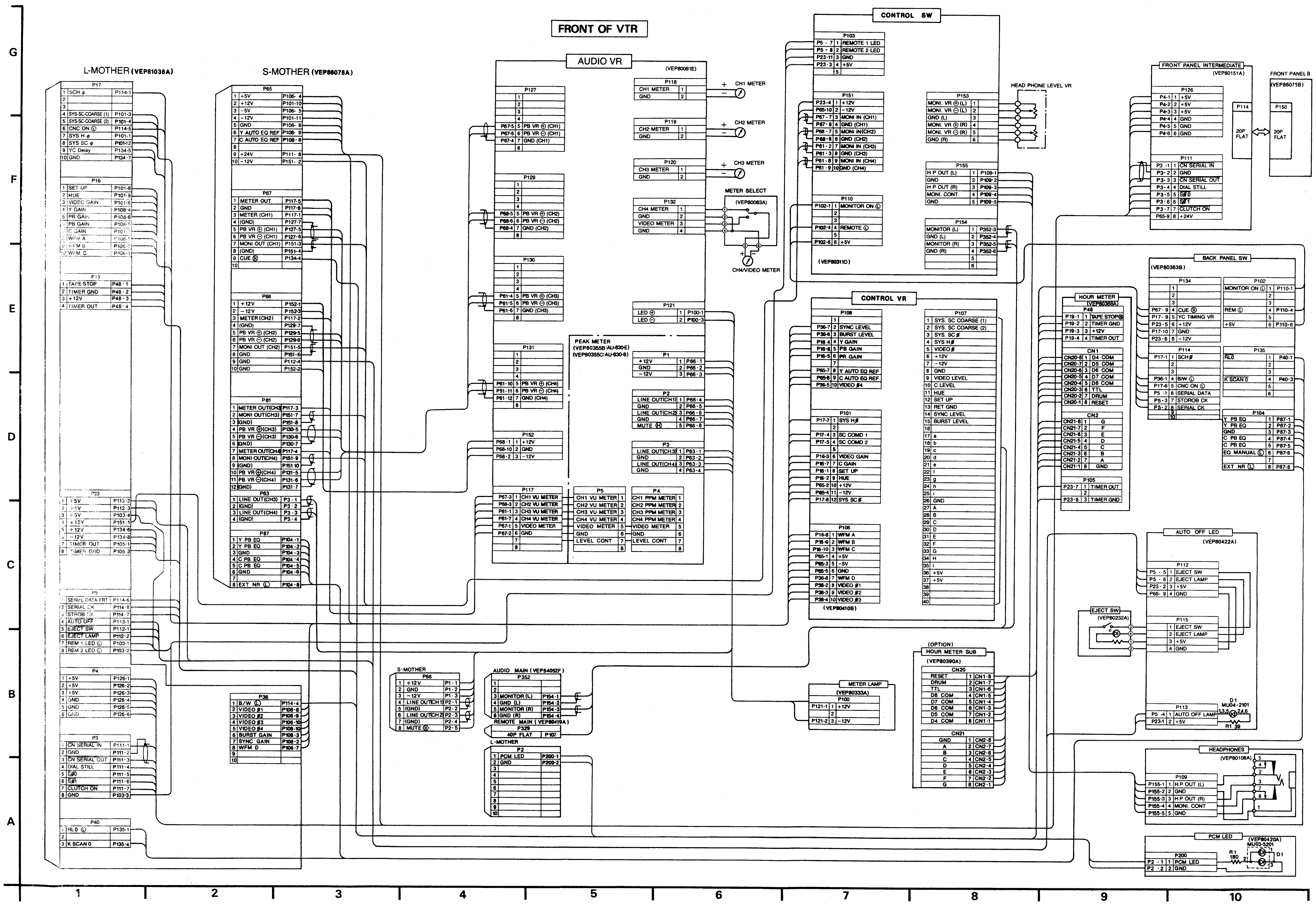
SWITCHING POWER 1, 2 BLOCK DIAGRAM



REVERSE SIDE

INTERCONNECTION
SCHEMATIC DIAGRAM (1/3), (2/3)

INTERCONNECTION SCHEMATIC DIAGRAM (1/3)



INTERCONNECTION SCHEMATIC DIAGRA	
PEAK METER (E-5) (PAGE 4-70)	
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P2	D-6
P3	D-6
P4	C-6
P5	C-6
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P4	B-1
P5	C-1
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P17	G-1
P19	E-1
P23	C-1
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HOUR METER (E-9) (PAGE 4-71)	
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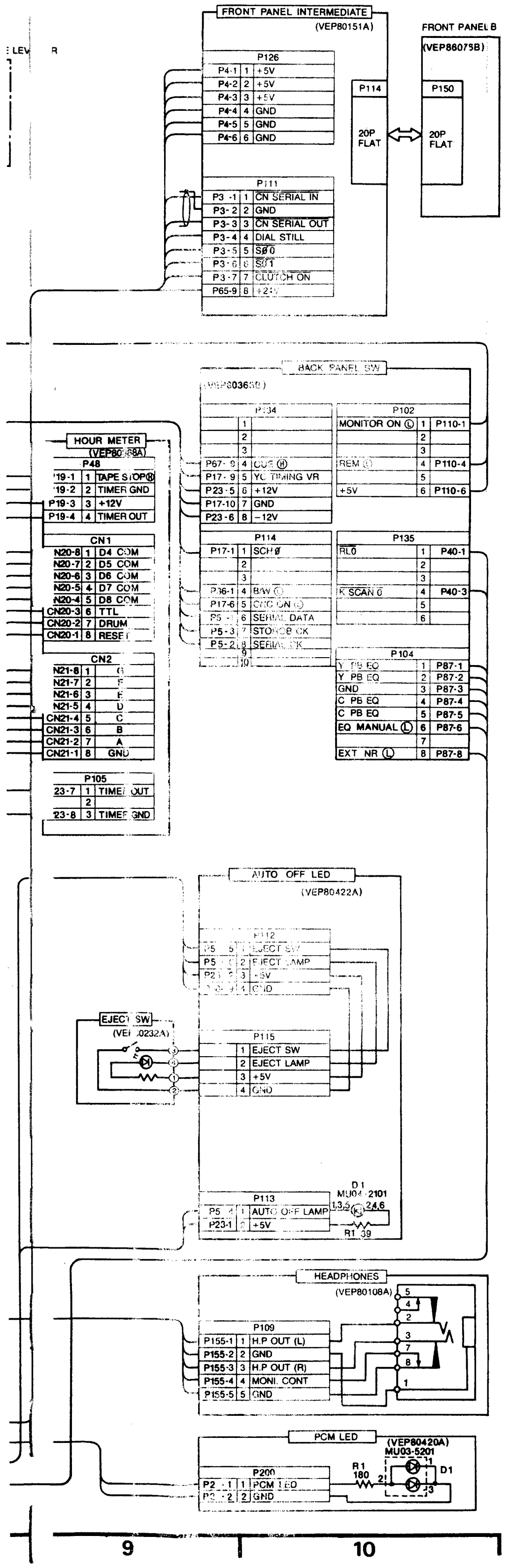
CN20	
CN-21	

ADDRESS INFORMATION

INTERCONNECTION SCHEMATIC DIAGRAM (2/3)



INTERCONNECTION SCHEMATIC DIAGRAM (1/3)	
PEAK METER (E-5) (PAGE 4-70)	
P1	E-6
P2	D-6
P3	D-6
P4	C-6
P5	C-6
L-MOTHER (G-1) (PAGE 4-23)	
P2	A-5
P3	B-1
P4	B-1
P5	C-1
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P17	G-1
P19	E-1
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HOUR METER (E-9) (PAGE 4-71)	
P48	E-9
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METER LAMP (B-7) (PAGE 4-71)	
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P101	D-7
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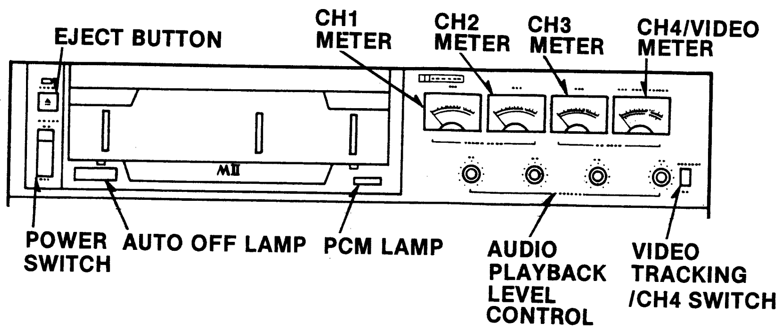
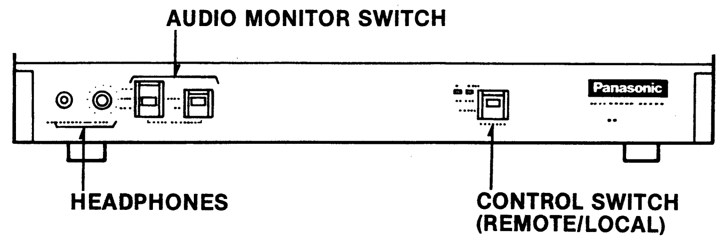
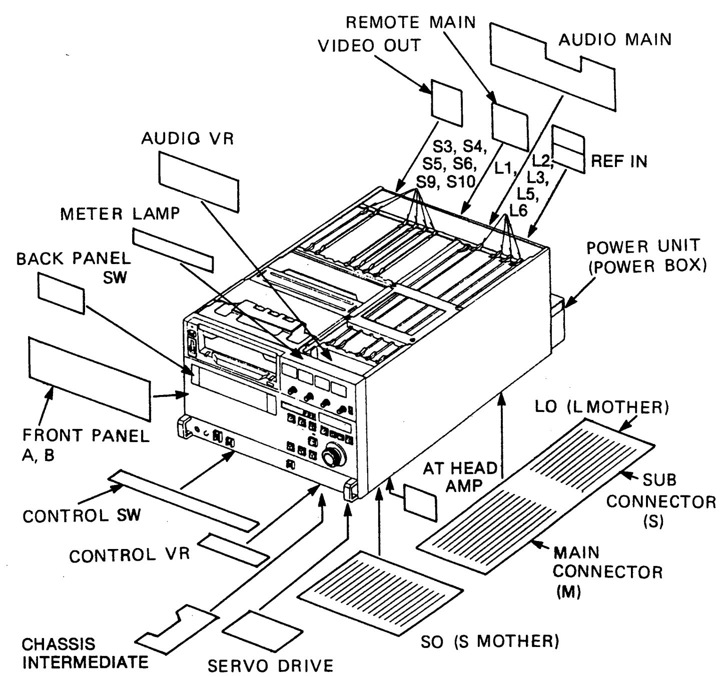
ADDRESS INFORMATION

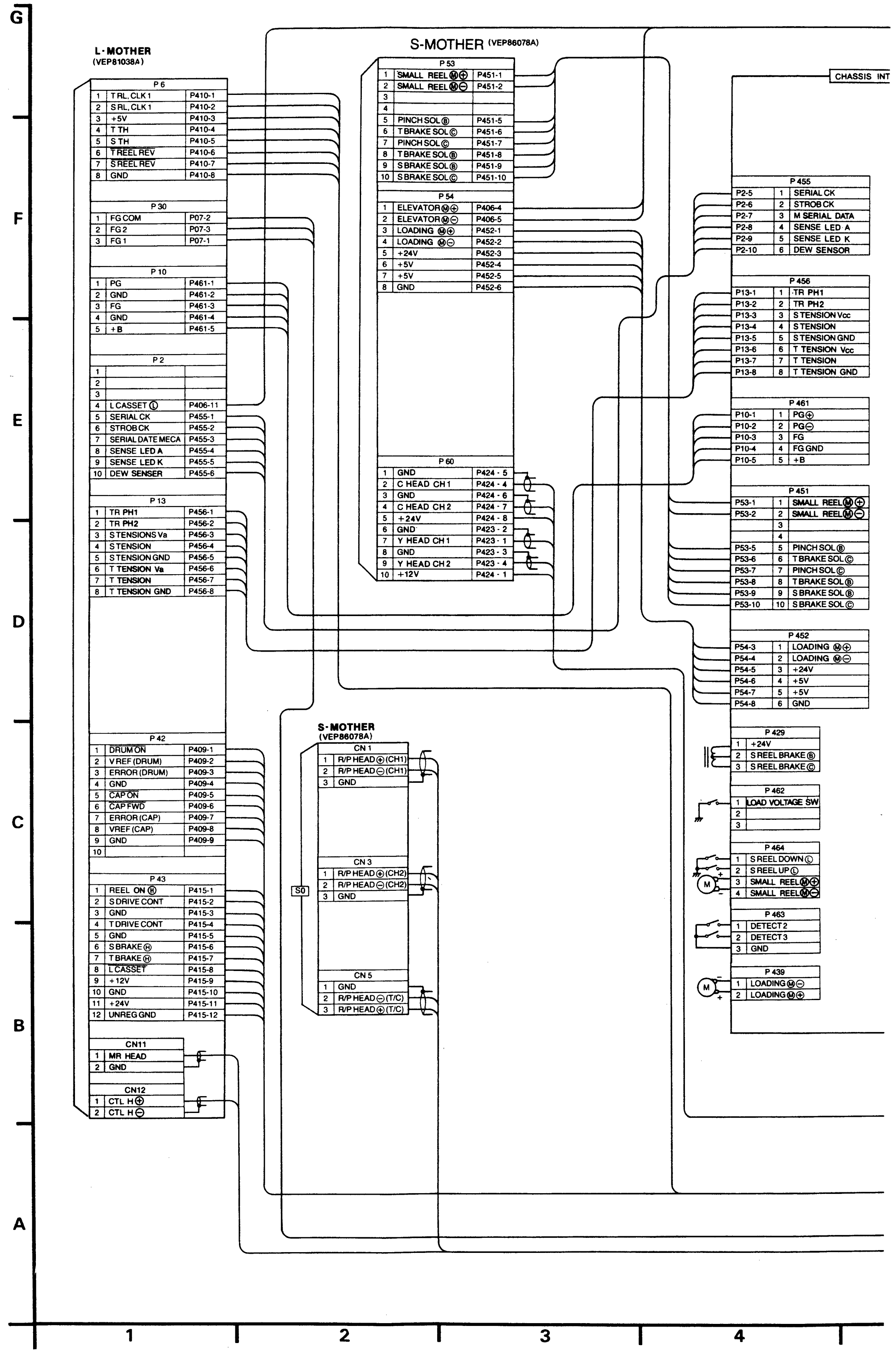
UPPER PANEL



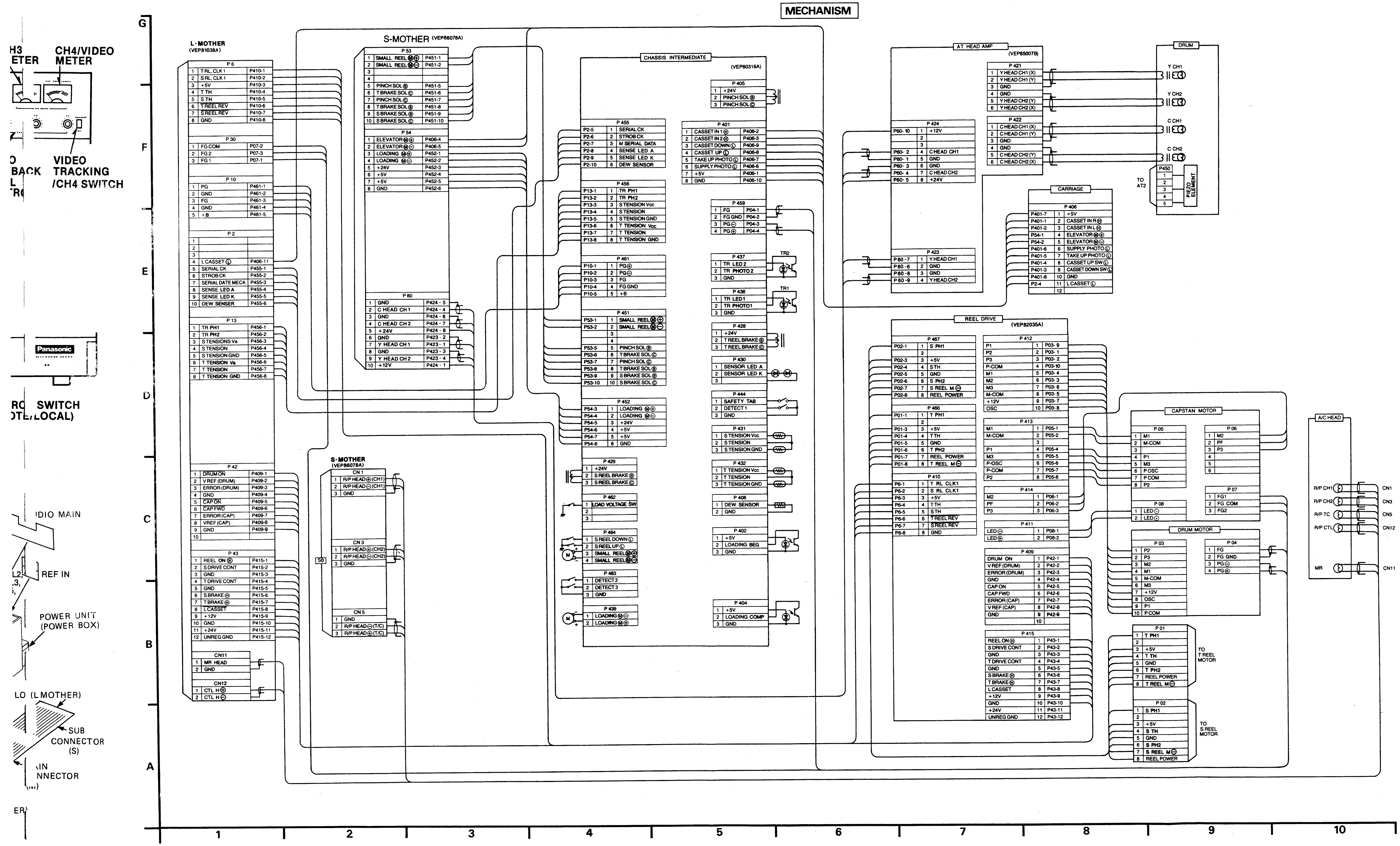
LOWER PANEL







INTERCONNECTION SCHEMATIC DIAGRAM (2/3)



INTERCONNECTION SCHEMATIC DIAGRAM (2/3)	
REEL MOTOR (B-9)	
P01	B-9
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P13	E-1
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P43	C-1
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CN3	C-2
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P405	G-5
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P455	F-4
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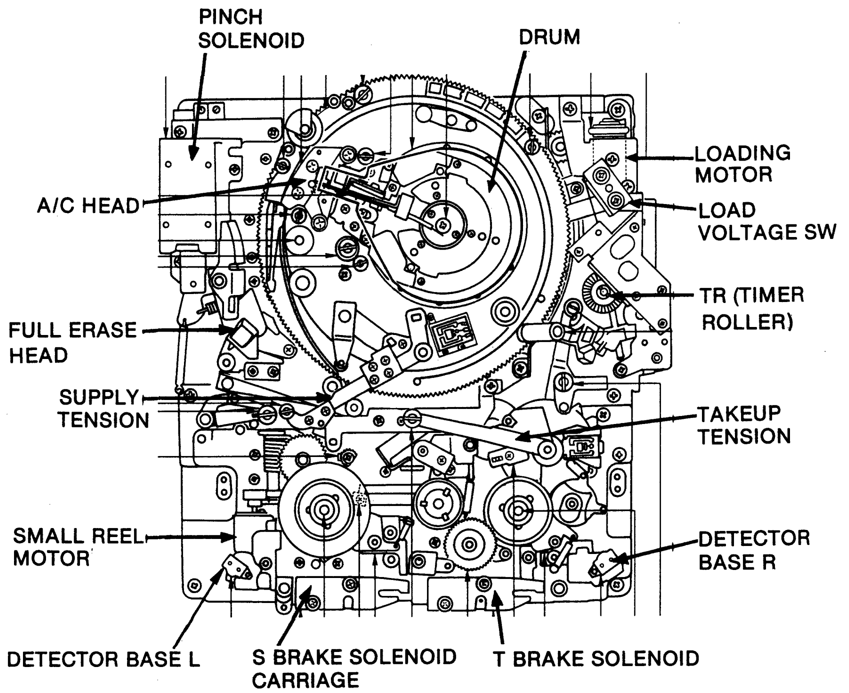
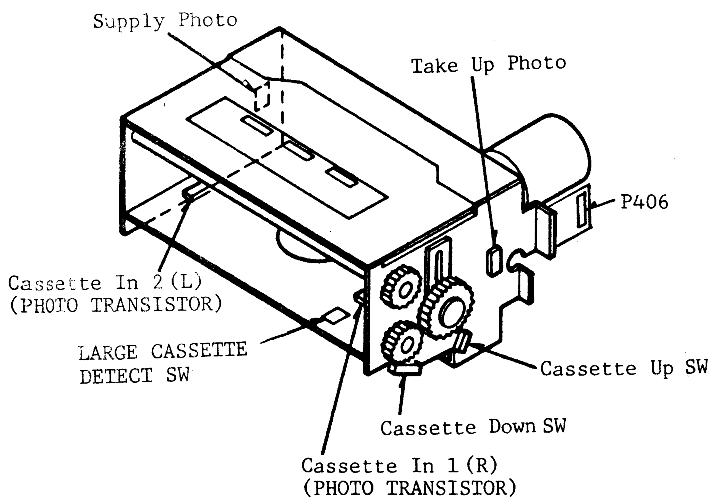
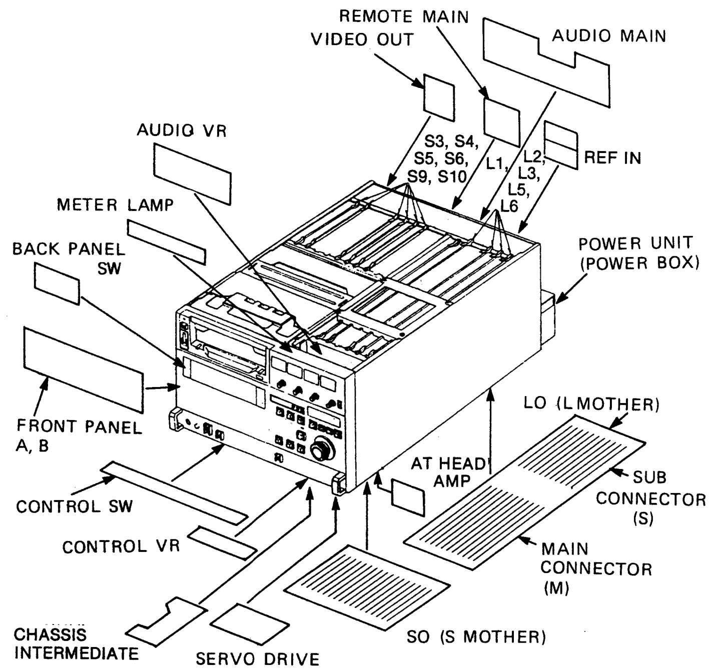
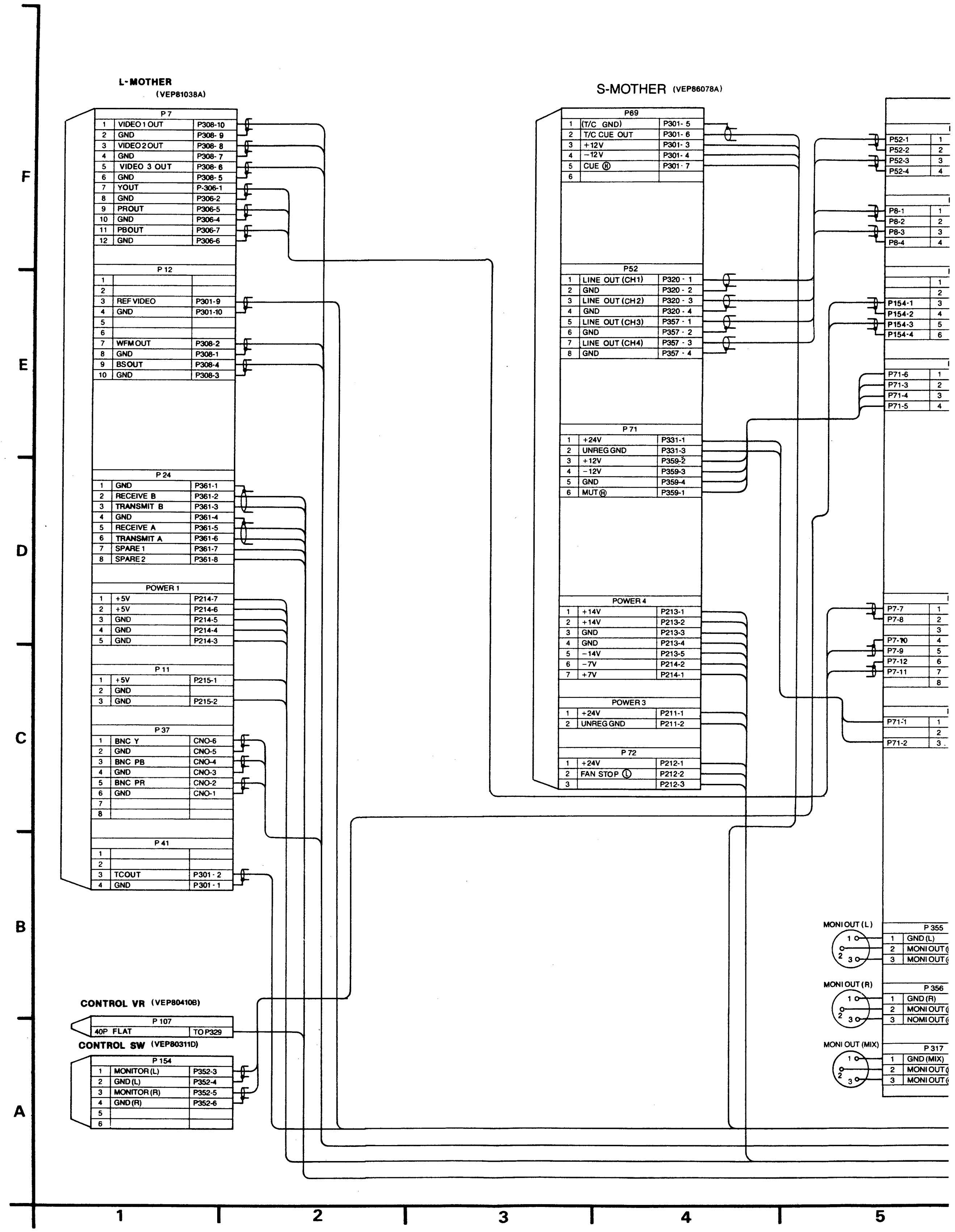
ADDRESS INFORMATION



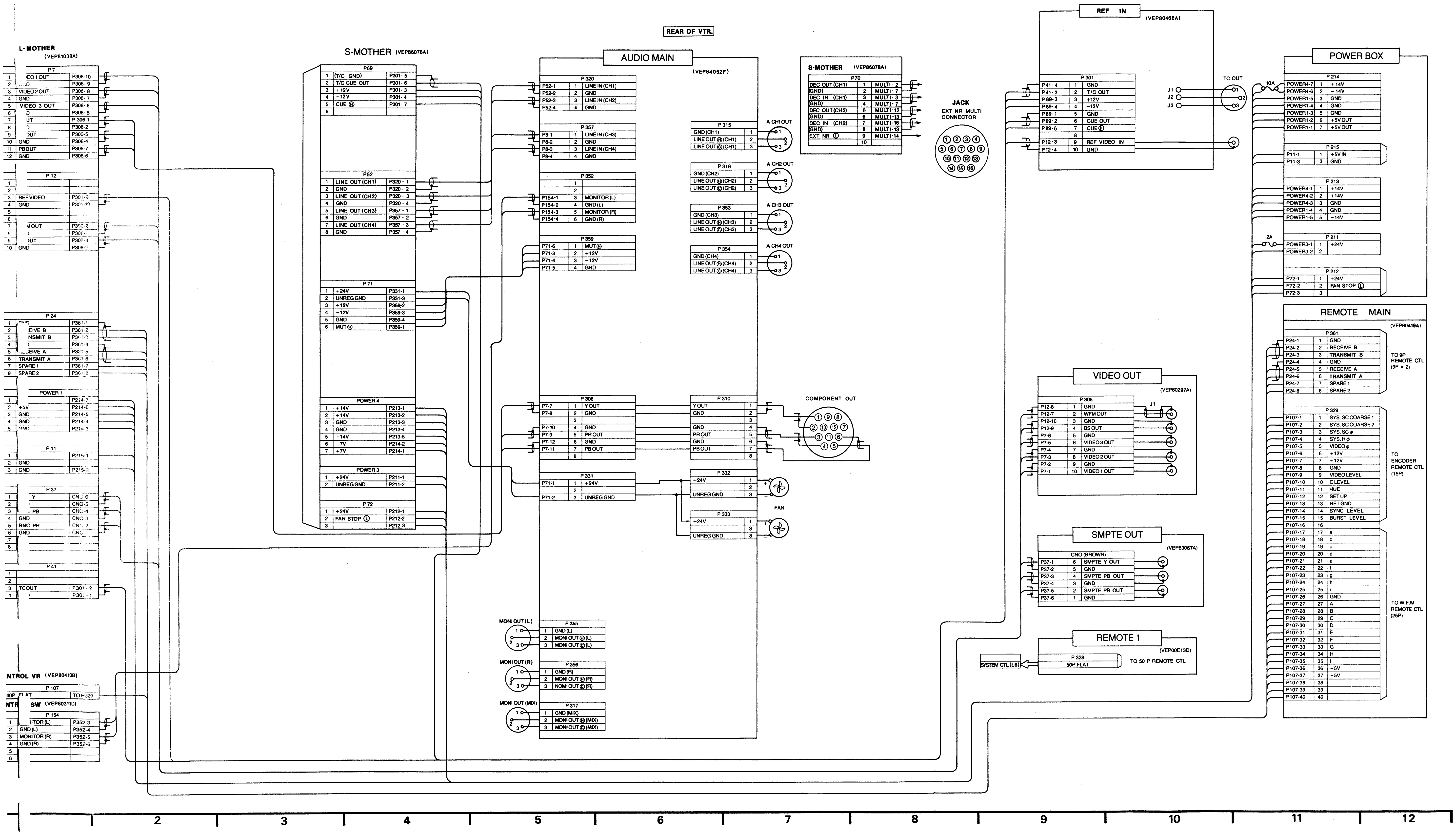


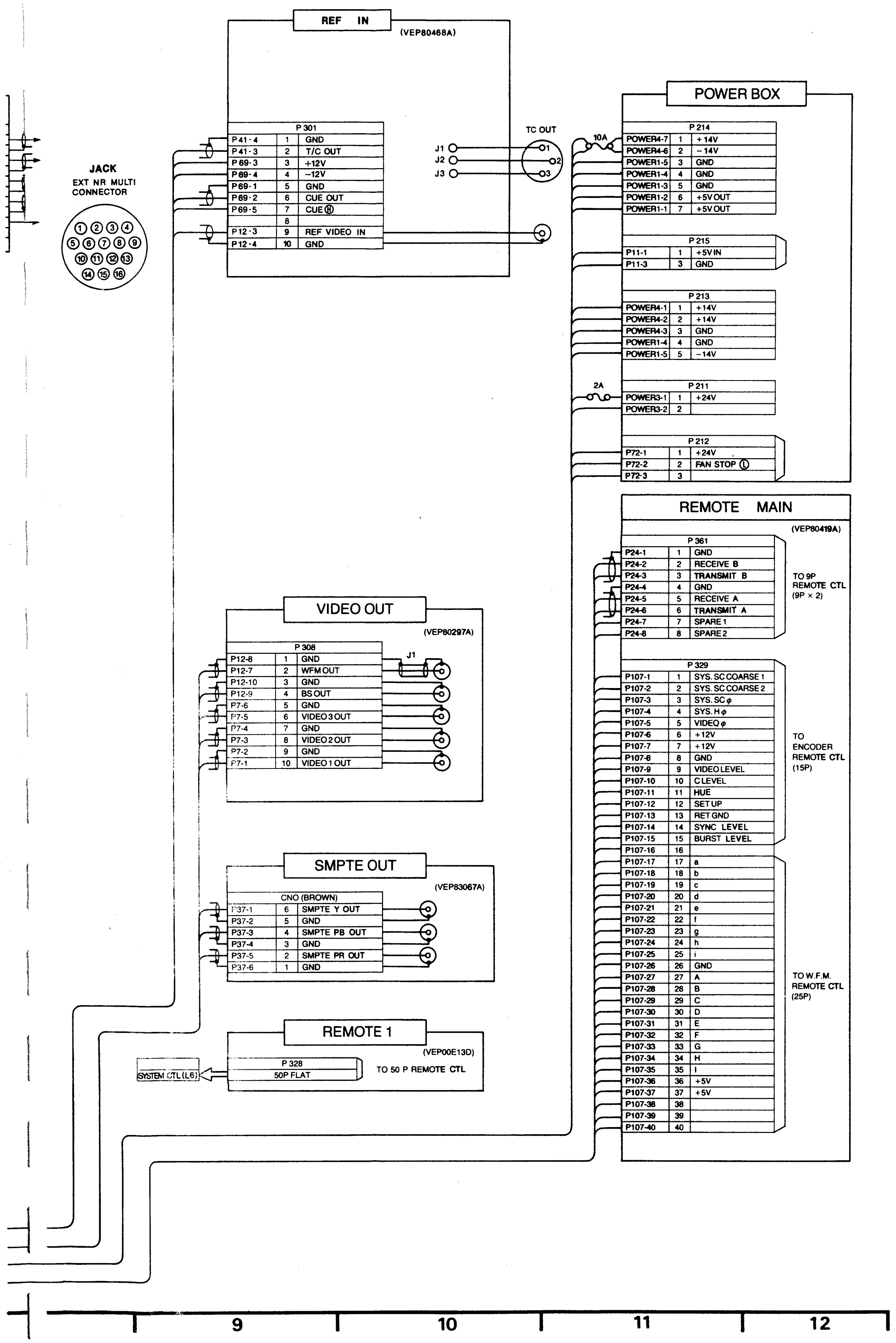


INTERCONNECTION SCHEMATIC DIAGRAM (3/3)



CONNECTION SCHEMATIC DIAGRAM (3/3)





INTERCONNECTION SCHEMATIC DIAGRAM (3/3)

L-MOTHER (F-1) (PAGE 4-23)	
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P12	E-1
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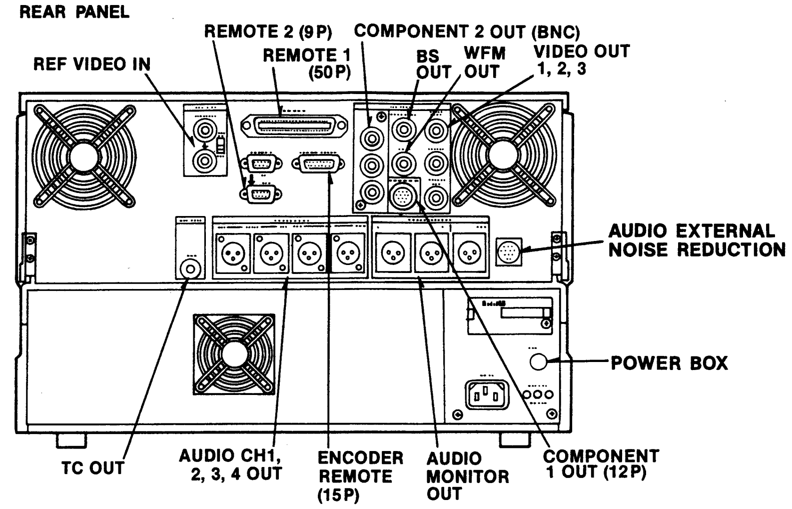
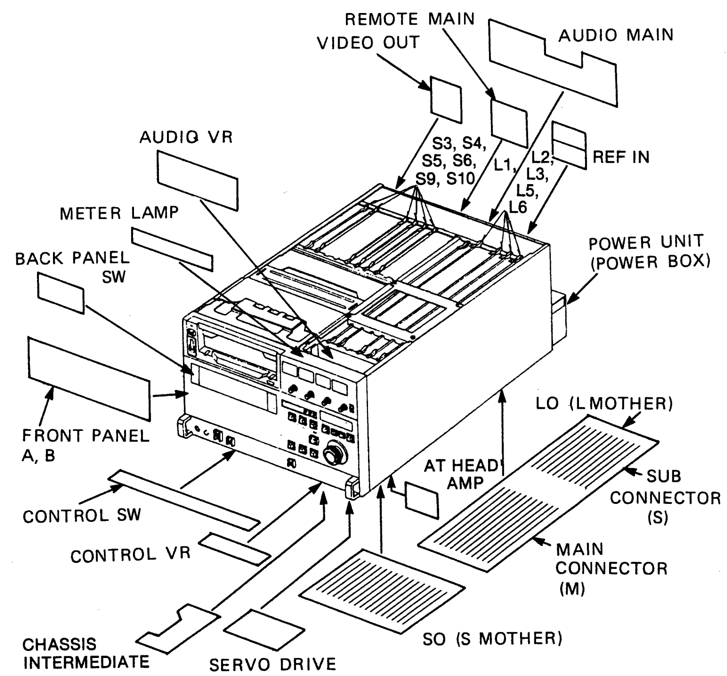
ADDRESS INFORMATION

REAR PANEL

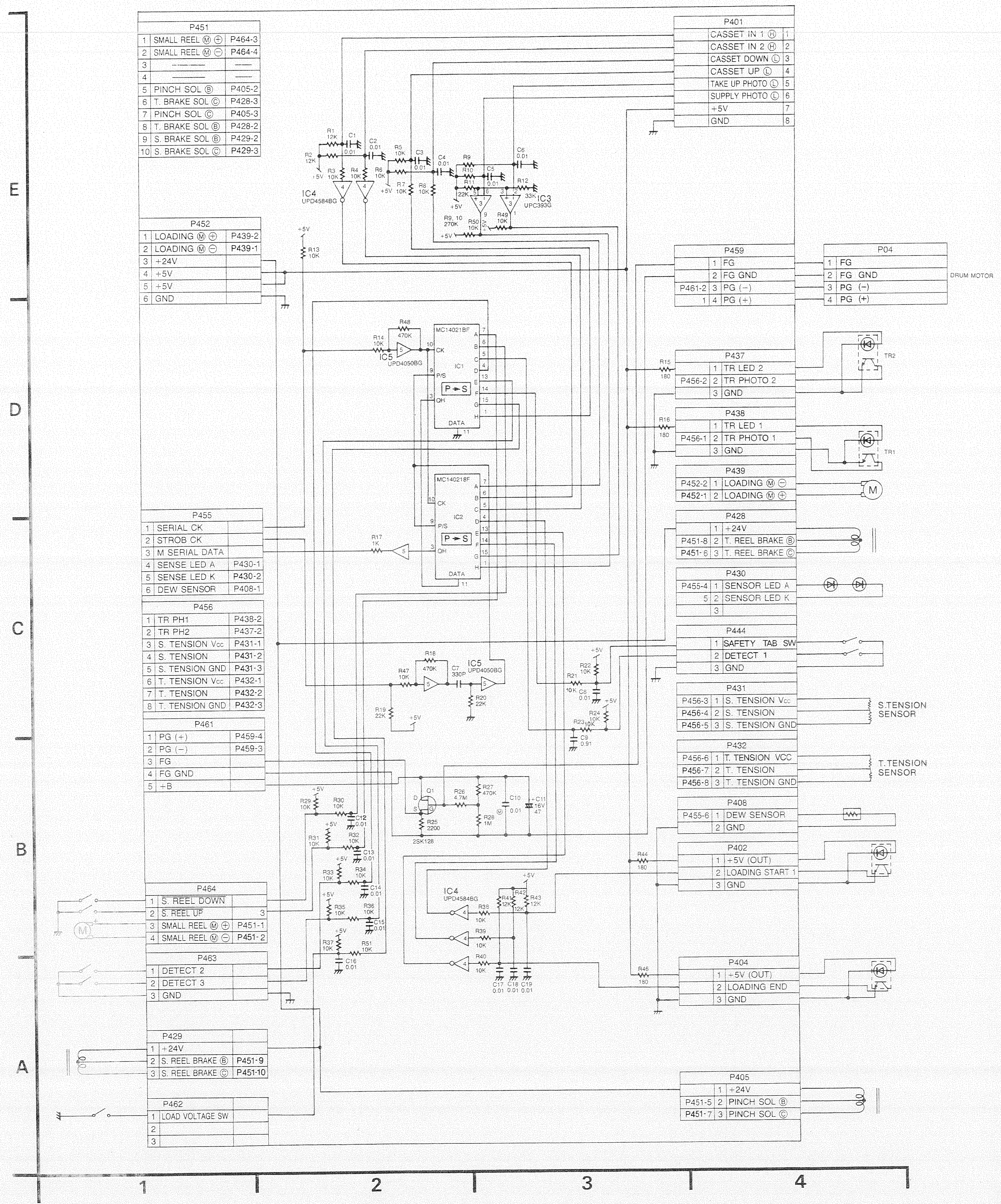




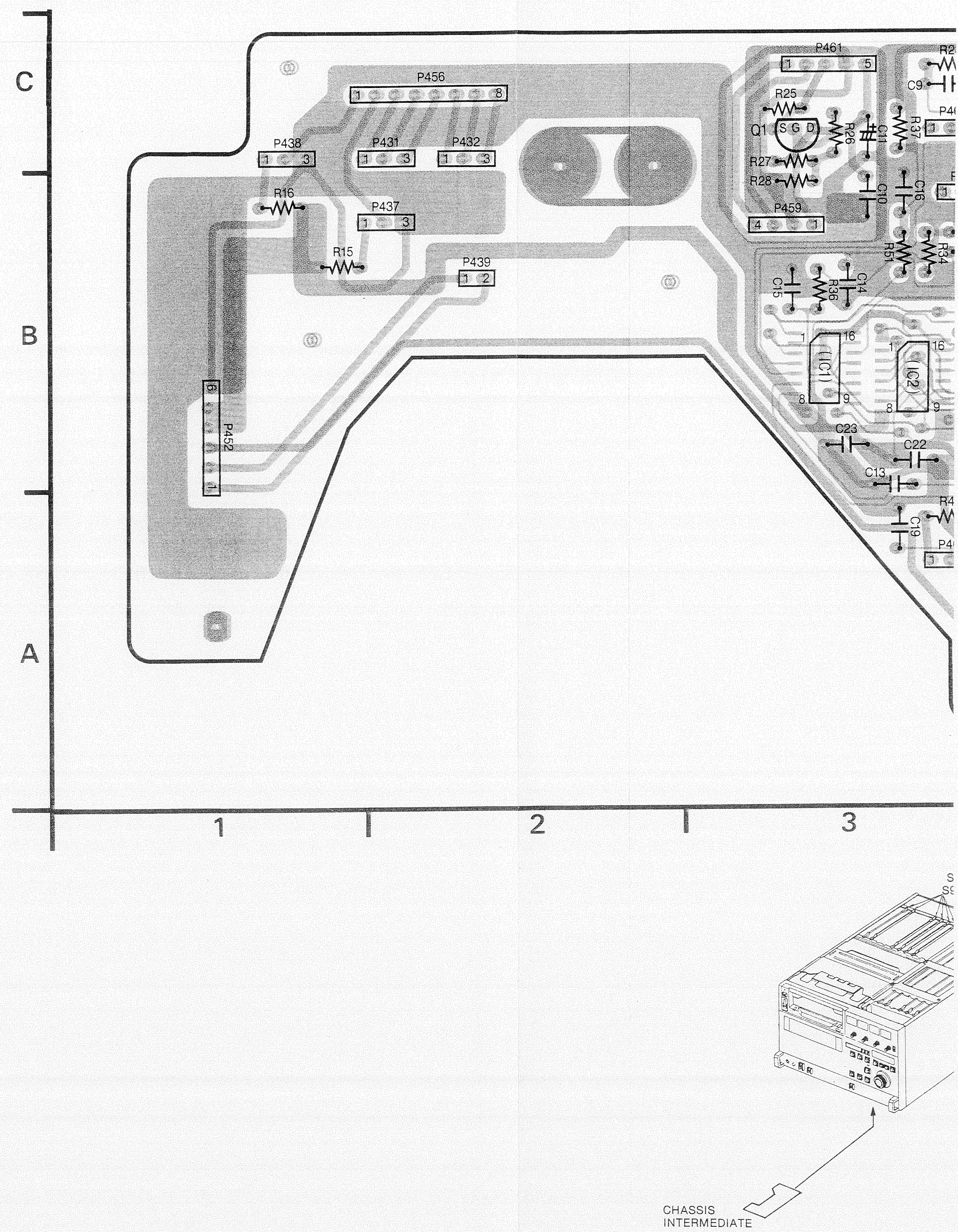
REVERSE SIDE

CHASSIS CONNECTION
LO L MOTHER P.C.B.

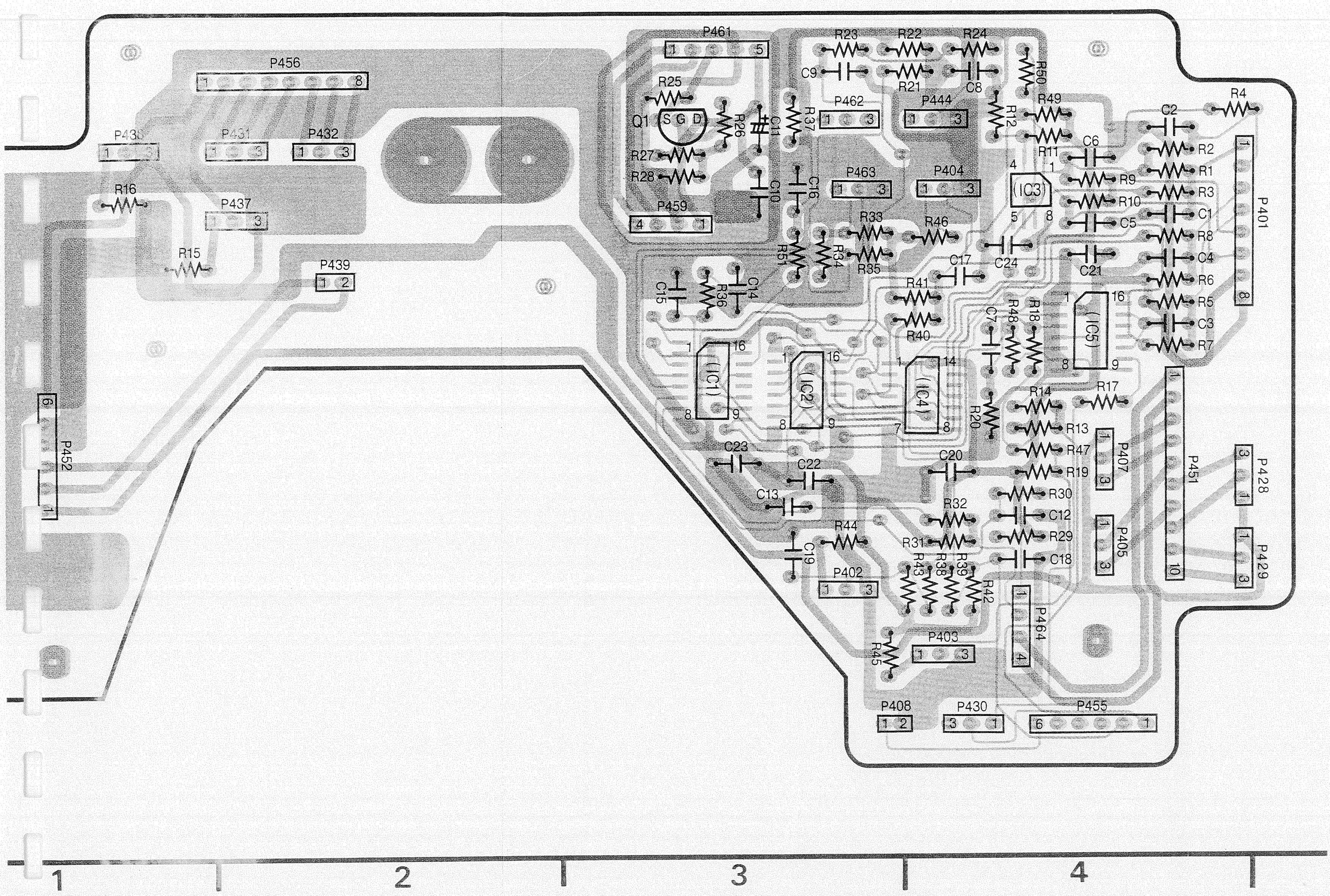
CHASSIS CONNECTION SCHEMATIC DIAGRAM

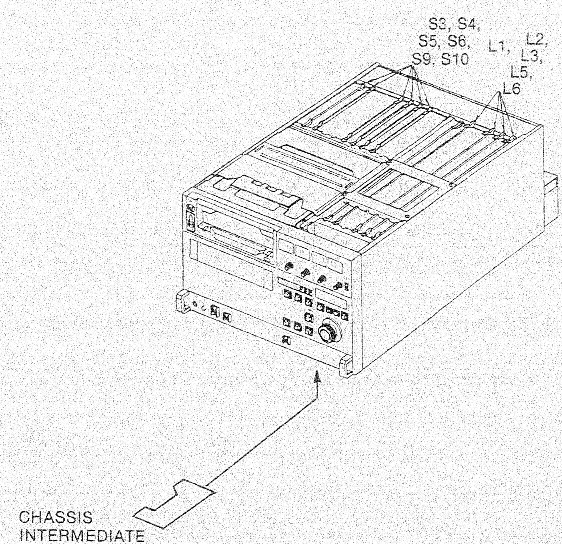


CHASSIS CONNECTION P.C. BOARD (VEP80316A)

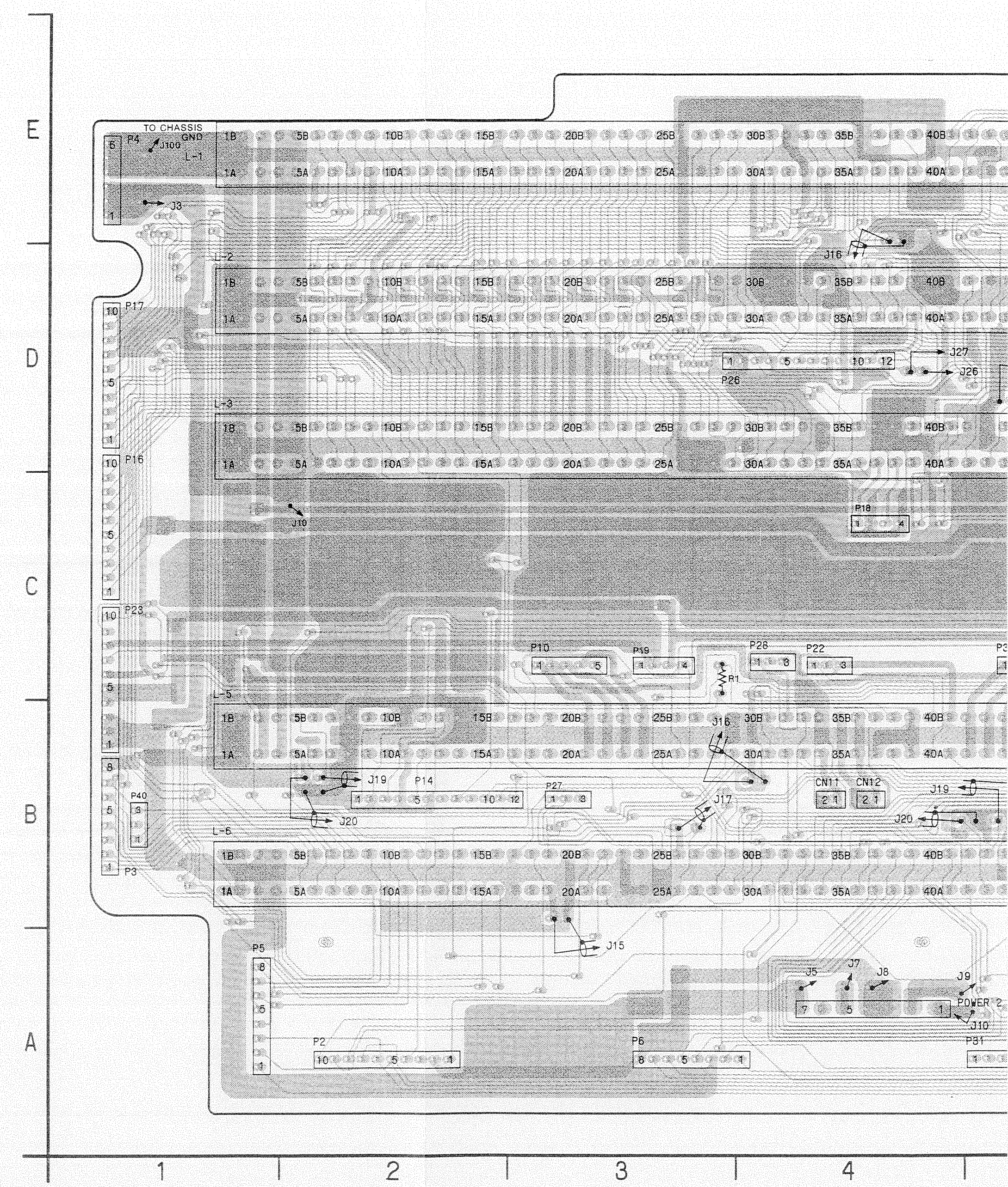


NNECTION P.C. BOARD (VEP80316A)

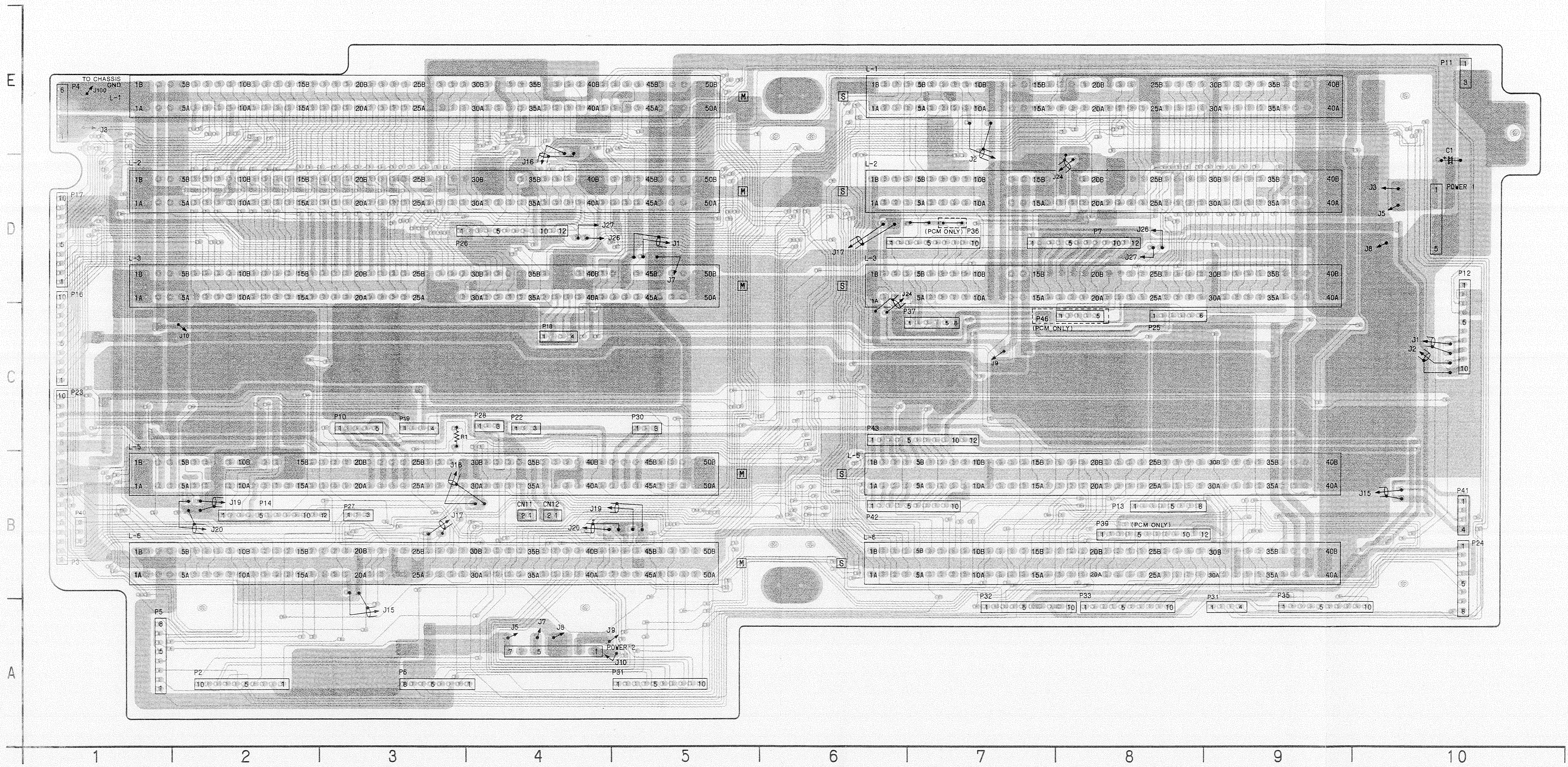




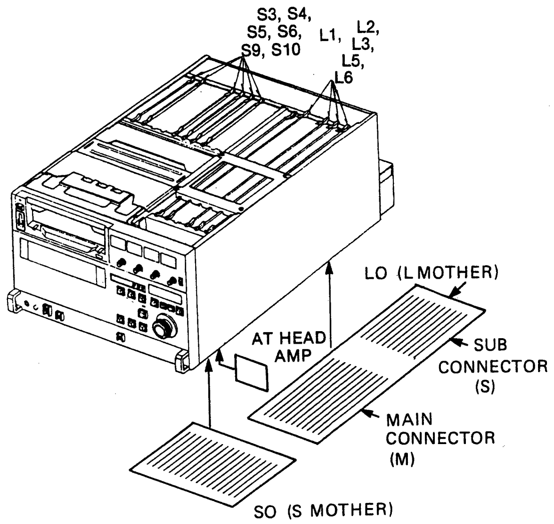
L0 L MOTHER P.C. BOARD (VEP81038A)



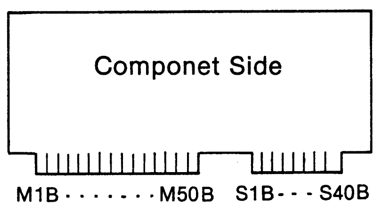
L0 L MOTHER P.C. BOARD (VEP81038A)

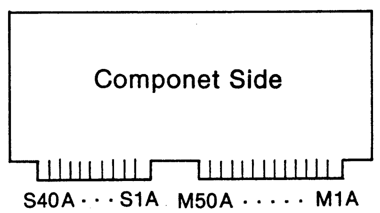


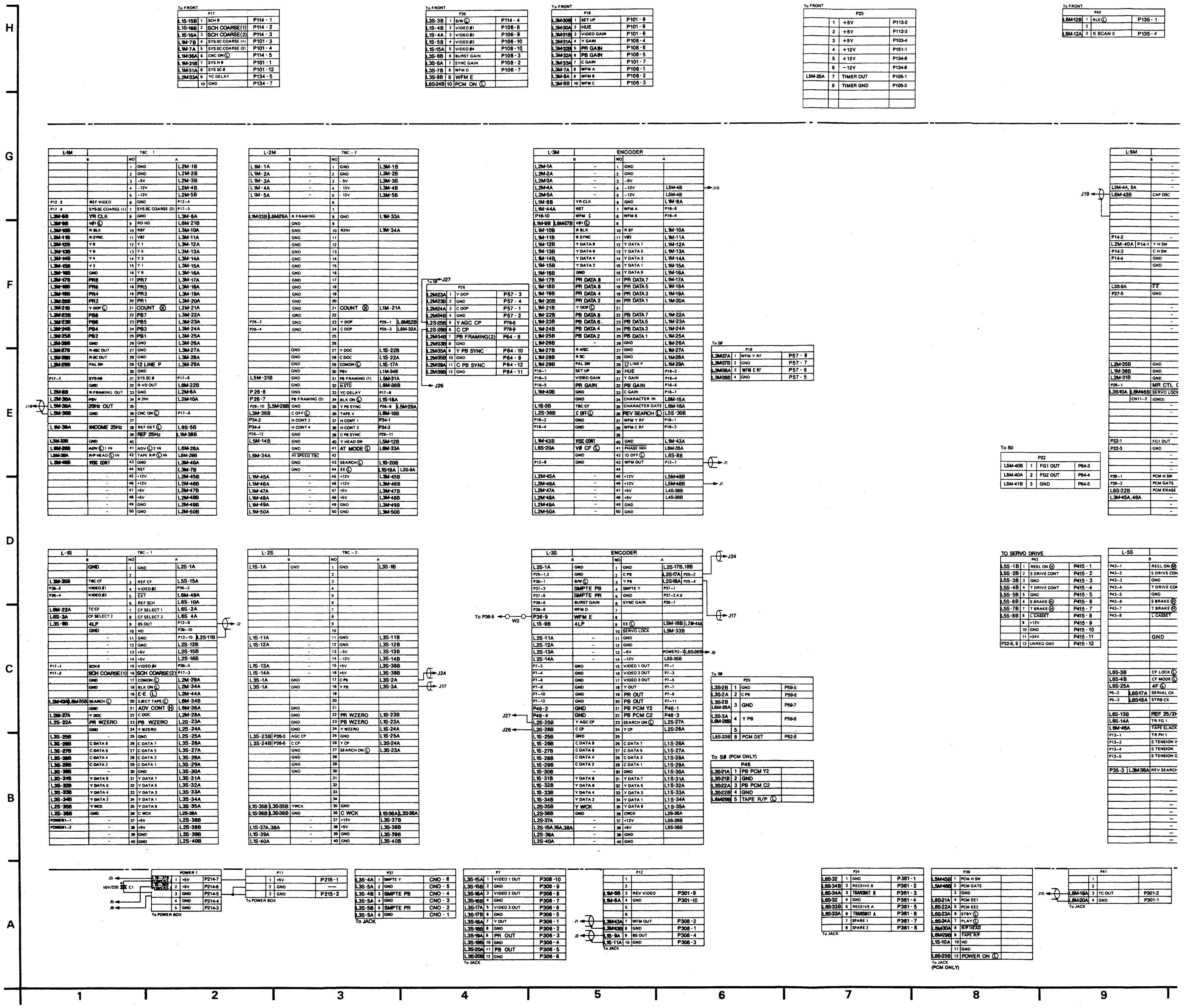
L0 L MOTHER SCHEMATIC DIAGRAM



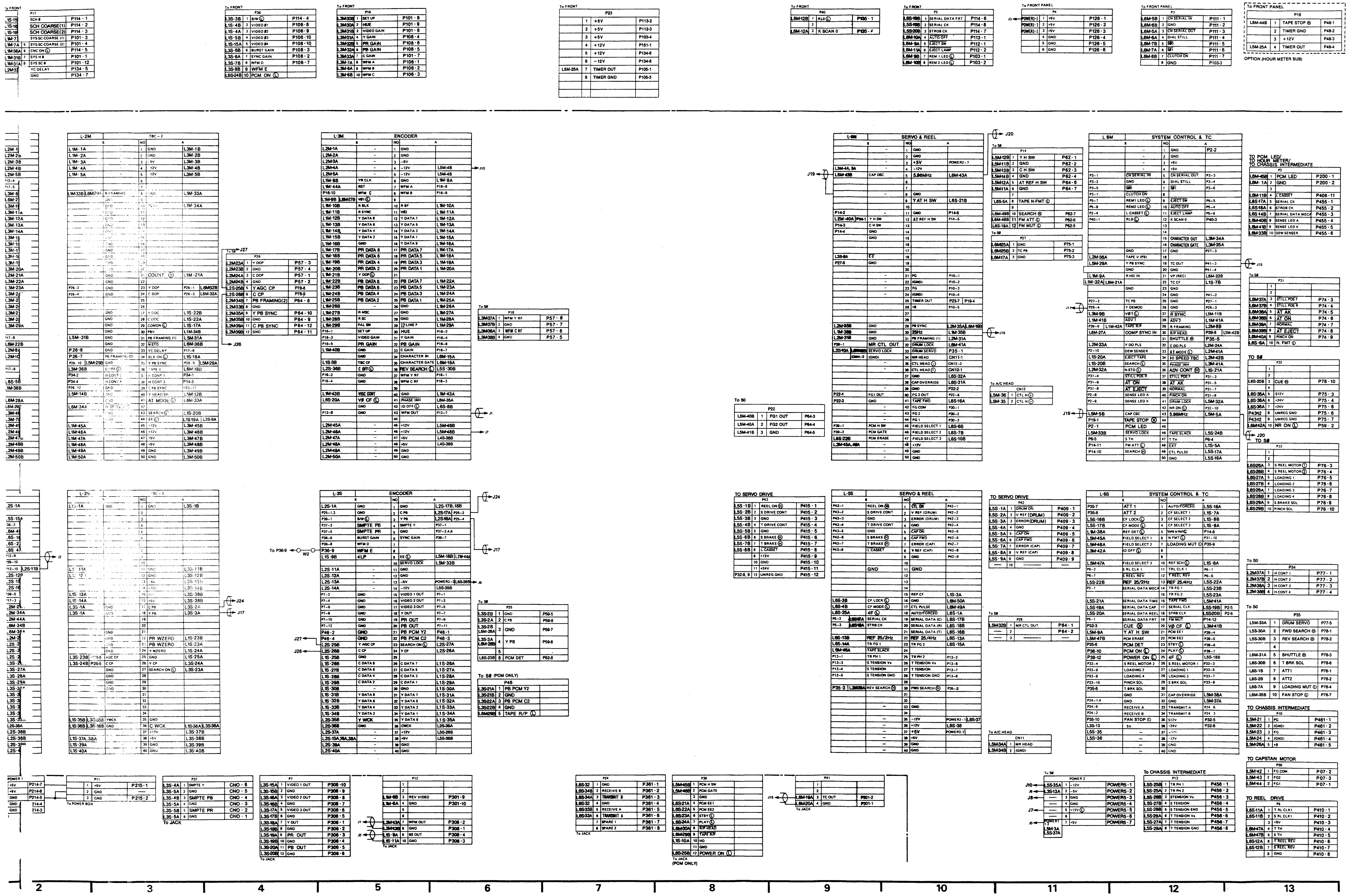
L (LARGE) Printed Circuit Board







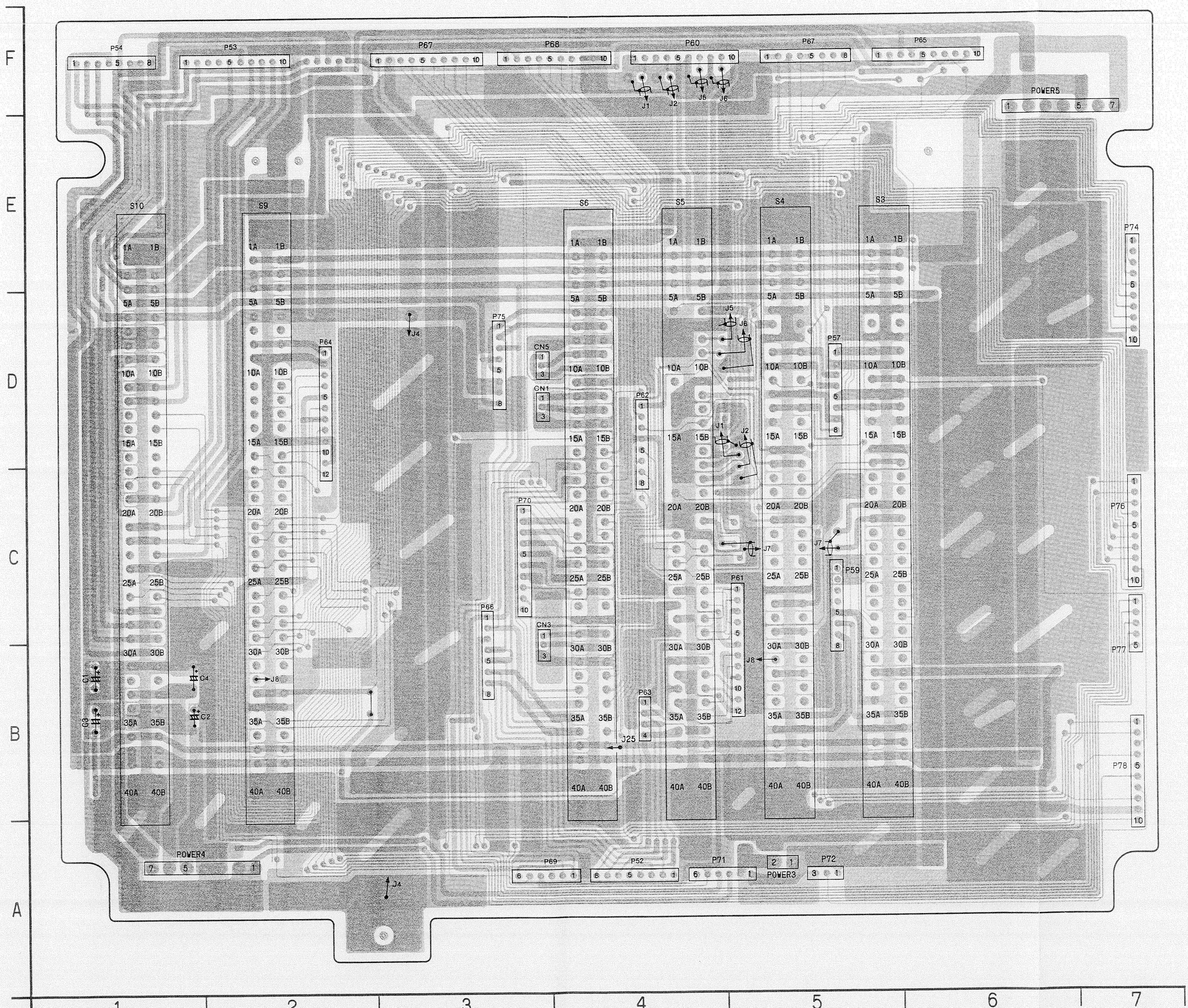
S CHEMATIC DIAGRAM



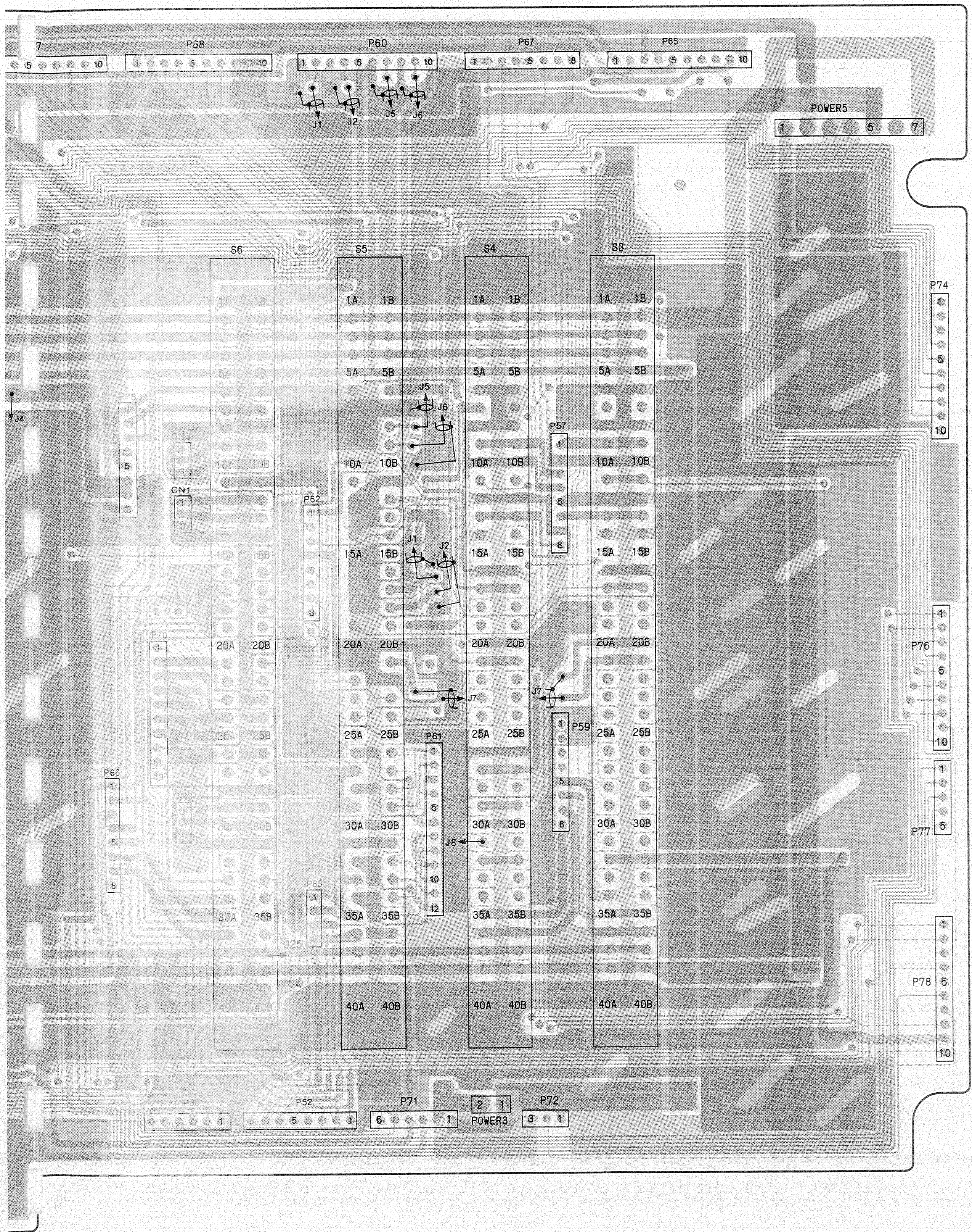
REVERSE SIDE

S0 S MOTHER P.C.B.

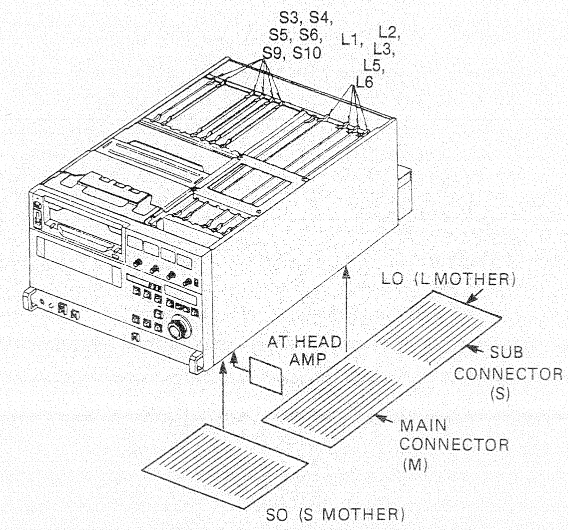
S0 S MOTHER P.C. BOARD (VEP86078A)



6 78A)

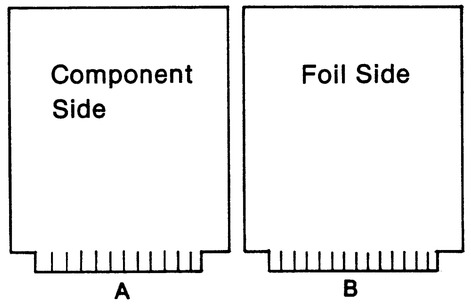


3 4 5 6 7


S3, S4, S5, S6, S9, S10
L1, L2, L3, L5, L6
LO (L MOTHER)
AT HEAD AMP
SUB CONNECTOR (S)
MAIN CONNECTOR (M)
SO (S MOTHER)

S0 S MOTHER SCHEMATIC DIAGRAM

S (SMALL) Printed Circuit Board



To L0

P74			
	1		
	2		
S9-21A	3	STILL POS F	P31-3
S9-22A	4	STILL POS R	P31-4
S9-28A	5	AT AK	P31-5
S9-29B	6	AT ON	P31-6
S9-30B	7	NORMAL PLAY	P31-7
S9-30A	8	AT EJECT	P31-8
S9-29A	9	PINCH ON	P31-9
	10		

To L0

P76			
S6-20A	1	ATT (1)	P35-7
S6-21A	2	ATT (2)	P35-8
S10-13B	3	S REEL MOTOR ①	P33-3
S10-14B	4	S REEL MOTOR ②	P33-4
S10-25A	5	LOADING 1 Ⓗ	P33-5
S10-25B	6	LOADING 2 Ⓗ	P33-6
S10-26A	7	LOADING 3 Ⓗ	P33-7
S10-26B	8	LOADING 4 Ⓗ	P33-8
S10-18A	9	S BRK SOL Ⓗ	P33-9
S10-17B	10	PINCH SOL Ⓗ	P33-10

To L0

P77			
S9-21B	1	H CONT 1	P34-1
S9-22B	2	H CONT 2	P34-2
S9-23B	3	H CONT 3	P34-3
S9-24B	4	H CONT 4	P34-4
S9-28B	5	DRUM SERVO	P35-1

To L0

P78			
S4-29	1	FWD SEARCH Ⓗ	P35-2
S4-30	2	REW SEARCH Ⓗ	P35-3
S3-11	3	SHUTTLE Ⓗ	P35-5
S6-21B	4	LOADING MUT	P35-9
	5		
S10-18B	6	T BRK SOL Ⓗ	P35-6
P72-2	7	FAN STOP Ⓛ	P35-10
S4-32	8	Y AGC CP	P26-5
S3-32	9	C CP	P26-6
S6-15A	10	CUE Ⓗ	P32-3

To L0

POWER 5			
S3-38B	1	−12V	POWER2-1
S10-36AB	2	−5V	POWER2-2
	3	GND	POWER2-3
	4	GND	POWER2-4
S10-4B	5	+12V	POWER2-5
	6		
S3-2B	7	+15V	POWER2-7

S-3	C PLAYBACK				
B		NO	A		
	—	1	GND	S4-1B	
POWER5-7	—	2	+5V	S4-2B	
	—	3	+12V	S4-3B	
	—	4	+12V	S4-4B	
		5	+24V	S4-5B	
	—	6	GND		
		7			
	—	8	GND		
S5-24B	—	9	C DO PULSE	P57-1	S9-35B
	—	10	GND	P57-2	
	—	11	SHUTTLE Ⓗ	P78-3	
	—	12	GND	P57-5	
	—	13	C ENV OUT	P57-6	
	—	14	GND		
		15			
	—	16	GND	S5-19A	
	—	17	C HEAD SW	S5-19B	
		18			
		19			
	—	20	GND	S5-21A	
	—	21	C RF IN	S5-21B	
		22			
		23			
		24			
		25			
		26			
		27			
P65-7	C AUTO EQ REF	28	EQ MANUAL Ⓛ	P87-6	S4-11A
		29	C PB EQ	P87-4, 5	
		30			
		31			
	—	32	C CP	P78-9	
		33			
		34	GND		
	—	35	C DEMOD OUT	P59-6	
	—	36	GND	P59-5	
	—	37	−5V	S4-37B	
POWER5-1	—	38	−12V	S4-38B	
	—	39	GND	S4-39B	
	—	40	GND	S4-40B	

J7

To BACK PANEL SW

P87			
S4-27	1	Y PB EQ	P104-1
S4-27	2	Y PB EQ	P104-2
S4-26	3	GND	P104-3
S3-29A	4	C PB EQ	P104-4
S3-29A	5	C PB EQ	P104-5
S3-28A	6	EQ MANUAL Ⓛ	P104-6
	7		
S6-34A	8	EXT NR Ⓛ	P104-8

To LØ

P57			
S3−9	1	C DO PULSE	P26−3
S3−10	2	GND	P26−4
S4−9	3	Y DO PULSE	P26−1
S4−10	4	GND	P26−2
S3−12	5	GND	P18−4
S3−13	6	C ENV OUT	P18−3
S4−12	7	GND	P18−2
S4−13	8	Y ENV OUT	P18−1

To L0

P59			
	1		
S6-22B	2	NR ON Ⓛ	P32-10
	3		
	4		
S3-36	5	GND	P25-1
S3-35	6	C DEMOD OUT 1	P25-2
S4-36	7	GND	P25-3
S4-35	8	Y DEMOD OUT 1	P25-4

S-4	Y PLAYBACK				
B		NO	A		
S3-1A	—	1	GND	S5-1B	
S3-2A	—	2	+5V	S5-2B	
S3-3A	—	3	+12V	S5-3B	
S3-4A	—	4	+12V	S5-4B	
S3-5A	—	5	+24V	S5-5B	
	GND	6	GND		
	—	7	Y RF METER	S9-32A	S5-12B
	—	8	GND		
	—	9	Y DO PULSE	P57-3	S9-35A
	—	10	GND	P57-4	
P65-6	Y AUTO EQ REF	11	EQ MANUAL Ⓛ	S3-28A	
	—	12	GND	P57-7	
	—	13	Y ENV OUT	P57-8	
	—	14	GND		
		15			
	—	16	GND	S5-10A	
	—	17	Y HEAD SW	S5-10B	
		18			
		19			
	—	20	GND	S5-6A	
	—	21	Y RF IN	S5-6B	
		22			
		23			
		24			
		25			
	—	26	GND	P87-3	
	—	27	Y PB EQ	P87-1, 2	
		28			
	—	29	FWD SEARCH Ⓗ	P78-1	
	—	30	REV SEARCH Ⓗ	P78-2	
		31			
	—	32	Y AGC CP	P78-8	
		33			
		34			
P59-8	—	35	Y DEMOD OUT 1		
P59-7	—	36	GND		
S3-37A	—	37	−5V	S5-37B	
S3-38A	—	38	−12V	S5-38B	
S3-39A	—	39	GND	S5-39B	
S3-40A	—	40	GND	S5-40B	

S9-33A

To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	−5V	P106-5
S10-37	4	−12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	−12V	P151-2

To AUC

S5-28
S5-29
S5-28
S5-26
S5-27
S5-26
S5-34
S5-35
S5-34
S5-32
S5-33
S5-32

F E D C B A

1 2 3 4 5 6 7

To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	−5V	P106-5
S10-37	4	−12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	−12V	P151-2

To AUDIO VR

P61			
S5-28B	1	METER OUT (CH3)	P117-3
S5-29B	2	MONI OUT (CH3)	P151-7
S5-28A	3	GND	P151-8
S5-26B	4	PB VR ⊕ (CH3)	P130-5
S5-27B	5	PB VR ⊖ (CH3)	P130-6
S5-26A	6	GND	P130-7
S5-34B	7	METER OUT (CH4)	P117-4
S5-35B	8	MONI OUT (CH4)	P151-9
S5-34A	9	GND	P151-10
S5-32B	10	PB VR ⊕ (CH4)	P131-5
S5-33B	11	PB VR ⊖ (CH4)	P131-6
S5-32A	12	GND	P131-7

To HEAD AMP

P60			
S5-17A	1	GND	P424-5
S5-17B	2	C HEAD CH1	P424-4
S5-18A	3	GND	P424-6
S5-18B	4	C HEAD CH2	P424-7
S5-5	5	+24V	P424-8
S5-8A	6	GND	P434-2
S5-8B	7	Y HEAD CH1	P434-1
S5-9A	8	GND	P434-3
S5-9B	9	Y HEAD CH2	P434-4
S5-4	10	+12V	P424-1

J1 J5 J6

To AUDIO VR
To CONTROL SW
To BACK PANEL

P67			
S5-15B	1	METER OUT	P117-5
S5-15A	2	GND	P117-6
S6-15B	3	METER (CH1)	P117-1
S6-16B	4	(GND)	P127-7
S6-17B	5	PB VR ⊕ (CH1)	P127-5
S6-18B	6	PB VR ⊖ (CH1)	P127-6
S6-19B	7	MONI OUT (CH1)	P151-3
S6-20B	8	(GND)	P151-4
S6-15A	9	CUE Ⓗ	P134-4
	10		

To AUDIO VR
To CONTROL SW
To AUTO OFF LED

P68			
S10-5	1	+12V	P152-1
S10-37	2	−12V	P152-3
S6-32B	3	METER (CH2)	P117-2
S6-33B	4	(GND)	P129-7
S6-34B	5	PB VR ⊕ (CH2)	P129-5
S6-35B	6	PB VR ⊖ (CH2)	P129-6
S6-36B	7	MONI OUT (CH2)	P151-5
S6-39B	8	GND	P151-6
S6-1	9	GND	P112-4
S6-1	10	GND	P152-2

K PA… W

P87			
	1	Y PB EQ	P104-1
	2	Y PB EQ	P104-2
		GND	P104-3
		C PB EQ	P104-4
		C PB EQ	P104-5
	6	EQ MANUAL Ⓛ	P104-6
	7		
		EXT NR Ⓛ	P104-8

P57			
	1	C DO PULSE	P26-3
	2	GND	P26-4
		Y DO PULSE	P26-1
		GND	P26-2
		GND	P18-4
		C ENV OUT	P18-3
	7	GND	P18-2
	8	Y ENV OUT	P18-1

P59			
		NR ON Ⓛ	P22-10
	3		
	4		
		GND	P25-1
		C DEMOD OUT	P25-2
		GND	P25-3
	8	Y DEMOD OUT	P25-4

S-4		Y PLAYBACK			
B		NO	A		
S3-1A	—	1	GND	S5-1B	
S3-2A	—	2	+5V	S5-2B	
S3-3A	—	3	+12V	S5-3B	
S3-4A	—	4	+12V	S5-4B	
S3-5A	—	5	+24V	S5-5B	
	GND	6	GND		
	—	7	Y RF METER	S9-32A	S5-12B
	—	8	GND		
	—	9	Y DO PULSE	P57-3	S9-35A
	—	10	GND	P57-4	
P65-6	Y AUTO EQ REF	11	EQ MANUAL Ⓛ	S3-28A	
	—	12	GND	P57-7	
	—	13	Y ENV OUT	P57-8	
	—	14	GND		
		15			
	—	16	GND	S5-10A	
	—	17	Y HEAD SW	S5-10B	
		18			
		19			
	—	20	GND	S5-6A	
	—	21	Y RF IN	S5-6B	
		22			
		23			
		24			
		25			
	—	26	GND	P87-3	
	—	27	Y PB EQ	P87-1, 2	
		28			
	—	29	FWD SEARCH Ⓗ	P78-1	
	—	30	REV SEARCH Ⓗ	P78-2	
		31			
	—	32	Y AGC CP	P78-8	
		33			
		34			
P59-8	—	35	Y DEMOD OUT 1		
P59-7	—	36	GND		
S3-37A	—	37	−5V	S5-37B	
S3-38A	—	38	−12V	S5-38B	
S3-39A	—	39	GND	S5-39B	
S3-40A	—	40	GND	S5-40B	

J5 J6 J1 J2

S9-33A — W3 (OPEN) — J7

S-5			FM AUDIO & VIDEO PB AMP			
B			NO	A		
S4-1A		GND	1	—	S9-1B	
S4-2A		+5V	2	—	S6-2B	
S4-3A		+12V	3	—	S6-3B	
S4-4A		+12V	4	—	S6-4B	P60-10
S4-5A		+24V	5	—	S6-5B	
S4-21		Y RF OUT	6	GND	S4-20	
		GND	7	—		
P60-7		Y HEAD CH1	8	GND	P60-6	
P60-9		Y HEAD CH2	9	GND	P60-8	
P62-1	S4-17	Y HEAD SW	10	GND	P62-2	S4-16
		GND	11			
S4-7A		Y RF METER	12	GND		
			13	GND		
S5-24A	P62-3 S3-17	C HEAD SW	14	GND		
P67-1		METER OUT	15	GND	P67-2	
			16	GND		
P60-2		C HEAD CH1	17	GND	P60-1	
P60-4		C HEAD CH2	18	GND	P60-3	
			19	GND		
		GND	20	GND		
S3-21		C RF OUT ①	21	GND	S3-20A•B	
S9-34		GND	22	C RF OUT ②	S9-33A	
P62-5		MUT Ⓛ	23	SEARCH Ⓗ	P62-7	
S3-9		C DO PULSE	24	C HEAD SW	S5-19B	
P62-6		FM ATT Ⓛ	25	PCM DET Ⓛ	P62-8	
P61-4		PB VR ⊕ (CH3)	26	(GND)	P61-6	
P61-5		PB VR ⊖ (CH3)	27	A. GND	S6-39, 40	
P61-1		METER OUT (CH3)	28	(GND)	P61-3	
P61-2		MONI OUT (CH3)	29	A. GND	S6-39, 40	
P52-5	P63-1	LINE OUT (CH3)	30	(GND)	P52-6	P63-2
S6 -39, 40		A. GND	31	A. GND	S6-39, 40	
P61-10		PB VR ⊕ (CH4)	32	(GND)	P61-12	
P61-11		PB VR ⊖ (CH4)	33	A. GND	S6-39, 40	
P61-7		METER OUT (CH4)	34	(GND)	P61-9	
P61-8		MONI OUT (CH4)	35	A. GND	S6-39, 40	
P52-7	P63-3	LINE OUT (CH4)	36	(GND)	P52-8	P63-4
S4-37A		−5V	37	—	S6-37B	
S4-38A		−12V	38	—	S6-38B	
S4-39B		GND	39	—	S9-39B	
S4-40B		GND	40	—	S9-40B	

W4 — S9-33A

J18 J19

To L0

P62			
S5-10B	1	Y HEAD SW	P14-1
S5-10A	2	GND	P14-2
S5-19B	3	C HEAD SW	P14-3
S5-19A	4	GND	P14-4
S5-23B	5	MUT Ⓛ	P14-12
S5-25B	6	FM ATT Ⓛ	P14-11
S5-23A	7	SEARCH Ⓗ	P14-10
S5-25A	8	PCM DET Ⓛ	P25-6

To PEAK METER

P63			
S5-30B	1	LINE OUT (CH3)	P14-7
S5-30A	2	GND	P14-8
S5-36B	3	LINE OUT (CH4)	P14-9
S5-36A	4	GND	P14-10

S-6		AUDIO				
B		NO	A			
P68-8, 9, 10	GND	1	GND	POWER 4-3, 4		
S5-2A	+5V	2	+5V	S9-2B		
S5-3A	+12V	3	+12V	S9-3B		
S5-4A	+12V	4	+12V	S9-4B		
S5-5A	+24V	5	+24V	S9-5B		
P75-5	—	6	T/C GND	P69-1	P75-1	
	—	7	TC CUE OUT	P69-2	P75-2	
	GND	8	GND	CN5-1		
	—	9	R/P HEAD ⊕ (T/C)	CN5-3		
	—	10	R/P HEAD ⊖ (T/C)	CN5-2		
	T/C GND	11	T/C GND			
	—	12	R/P HEAD ⊕ (CH1)	CN1-1		
	—	13	R/P HEAD ⊖ (CH1)	CN1-2		
	(GND)	14	(GND)	CN1-3		
P67-3	METER (CH1)	15	CUE Ⓗ	P78-10	P69-5	P67-9
P67-4	(GND)	16				
P67-5	PB VR ⊕ (CH1)	17	LINE OUT (CH1)	P52-1	P66-4	
P67-6	PB VR ⊖ (CH1)	18	(GND)	P52-2	P66-5	
P67-7	MONI OUT (CH1)	19				
P67-8	(GND)	20	ATT (1)	P76-1		
P78-4	LOADING MUT Ⓛ	21	ATT (2)	P76-2		
P59-2	NR ON Ⓛ	22	MUT Ⓗ	P71-6	P66-8	
P70-2	(GND)	23	DOC OUT (CH1)	P70-1		
P70-3	DEC IN (CH1)	24	(GND)	P70-4		
P70-6	(GND)	25	DEC OUT (CH2)	P70-5		
P70-7	DEC IN (CH2)	26	(GND)	P70-8		
		27				
	GND	28	GND			
	—	29	R/P HEAD ⊕ (CH2)	CN3-1		
	—	30	R/P HEAD ⊖ (CH2)	CN3-2		
	(GND)	31	(GND)	CN3-3		
P68-3	METER (CH2)	32				
P68-4	(GND)	33	EXT NR Ⓛ	P70-9		
P68-5	PB VR ⊕ (CH2)	34	EXT NR ON Ⓛ	P87-8		
P68-6	PB VR ⊖ (CH2)	35	LINE OUT (CH2)	P52-3	P66-6	
P68-7	MONI OUT (CH2)	36	(GND)	P52-4	P66-7	
S5-37A	−5V	37	−5V	S9-37B		
S5-38A	−12V	38	−12V	S9-38B		
P68-8	GND	39	GND	POWER 4-3, 4		
S5-40A	GND	40	GND	POWER 4-3, 4		

To A/C HEAD

CN1		
S6-12	1	R/P HEAD (+) (CH1)
S6-13	2	R/P HEAD (−) (CH1)
S6-14	3	(GND)

To A/C HEAD

CN3		
S6-29	1	R/P HEAD (+) (CH2)
S6-30	2	R/P HEAD (−) (CH2)
S6-31	3	(GND)

To L0 (L6)

P75			
S6-6A	1	(T/C GND)	P27-1
S6-7A	2	T/C CUE OUT	P27-2
S6-3	3	S+12V	P32-5
S6-5	4	+24V	P32-6
S6-7B	5	(T/C GND)	P27-3
S9-6AB	6	UNREG GND	P32-8
S9-6AB	7	UNREG GND	P32-9
S6-5	8	+24V	P32-7

To PEAK METER

P66			
S6-4	1	+12V	P1-1
S6-39	2	GND	P1-2
S6-38	3	−12V	P1-3
S6-17A	4	LINE OUT (CH1)	P2-1
S6-18A	5	(GND)	P2-2
S6-35A	6	LINE OUT (CH2)	P2-3
S6-36A	7	(GND)	P2-4
S6-22A	8	MUT Ⓗ	P2-5

To L0

P64			
S9-8	1	MR CTL	P28-1
S9-9	2	GND	P28-2
S9-26A	3	FG1	P22-1
S9-26B	4	FG2	P22-2
S9-25B	5	GND	P22-3
S9-24A	6	REF H SW	P14-5
S9-25A	7	GND	P14-6
S9-17A	8	PB FRAME 2	P26-7
S9-15	9	GND	P26-10
S9-16B	10	Y PB SYNC	P26-9
S9-15	11	GND	P26-12
S9-16A	12	C PB SYNC	P26-11

To A/C HEAD

CN5		
S6-8	1	GND
S6-10	2	R/P HEAD (−) (T/C)
S6-9	3	R/P HEAD (+) (T/C)

J13

S − 9	
B	
S5-1A	−
S6-2A	−
S6-3A	−
S6-4A	−
S6-5A	−
	−
	−
P64−1	−
P64−2	−
P64−9,11	−
P64−10	Y PB SYNC
P77-1	HCONT 1
P77-2	HCONT 2
P77-3	HCONT 3
P77-4	HCONT 4
P64−5	−
P64−4	FG2
P77-5	DRUM SERVO Ⓛ
P74−6	AT ON Ⓛ
P74−7	NORM PLAY Ⓛ
	GND
S5-22B	−
S5-22B	−
S3 −9	C DO PLS
S6-37A	−
S6-38A	−
S5-39A	−
S5-40A	−

P52			
S6-17A	1	LINE OUT (CH1)	P320-1
S6-18A	2	GND	P320-2
S6-35A	3	LINE OUT (CH2)	P320-3
S6-36A	4	GND	P320-4
S5-30B	5	LINE OUT (CH3)	P357-1
S5-30A	6	GND	P357-2
S5-36B	7	LINE OUT (CH4)	P357-3
S5-36A	8	GND	P357-4

TO JACK

P69			
S6-6A	1	(T/G GND)	P301-5
S6-7A	2	T/C CUE OUT	P301-6
S6-4AB	3	+12V	P301-4
S6-38AB	4	−12V	P301-5
S6-15A	5	CUE Ⓗ	P301-7
S6-6A	6	T/C GND	P301-3

TO JACK (T/C OUT)

P70			
S6-23A	1	DEC. OUT (CH1)	
S6-23B	2	(GND)	
S6-24B	3	DEC. IN (CH1)	
S6-24A	4	(GND)	
S6-25A	5	DEC. OUT (CH2)	
S6-25B	6	(GND)	
S6-26B	7	DEC. OUT (CH2)	
S6-26A	8	(GND)	
S6-33A	9	EXT NR Ⓛ	
	10		

TO JACK (EXT NR CONNECTOR)

J3

P71			
POWER3-1	1	+24V	P331−1
POWER3-2	2		P331−3
S10−5	3	+ 14	P359−2
S10−38	4	−14	P359−3
S10−39	5	GND	P359−4
S6 −22A	6	MUT Ⓗ	P359−1

To AUDIO MAIN

POWER 3			
S10-6	1	+24V	P211−1
S10-24	2		P211−2

To POWER BOX

J3

P72			
POWER3-1	1	+24V	P212−1
P78-7	2	FAN STOP Ⓛ	P212−2
POWER3-2	3		P212−3

To POWER BOX

S10-	
S10-	
S10-	
S10-	
S10-	

To PC…

5 6 7 8 9 10 11 12 13 14 15

To AUDIO VR
To CONTROL SW
To BACK PANEL

P67			
S5-15B	1	METER OUT	P117-5
S5-15A	2	GND	P117-6
S6-15B	3	METER (CH1)	P117-1
S6-16B	4	(GND)	P127-7
S6-17B	5	PB VR ⊕ (CH1)	P127-5
S6-18B	6	PB VR ⊖ (CH1)	P127-6
S6-19B	7	MONI OUT (CH1)	P151-3
S6-20B	8	(GND)	P151-4
S6-15A	9	CUE Ⓗ	P134-4
	10		

To AUDIO VR
To CONTROL SW
To AUTO OFF LED

P68			
S10-5	1	+12V	P152-1
S10-37	2	−12V	P152-3
S6-32B	3	METER (CH2)	P117-2
S6-33B	4	(GND)	P129-7
S6-34B	5	PB VR ⊕ (CH2)	P129-5
S6-35B	6	PB VR ⊖ (CH2)	P129-6
S6-36B	7	MONI OUT (CH2)	P151-5
S6-39B	8	GND	P151-6
S6-1	9	GND	P112-4
S6-1	10	GND	P152-2

To CHASSIS INTERMEDIATE

P53			
S10−11	1	S REEL Ⓜ⊕	P451−1
S10−12	2	S REEL Ⓜ⊖	P451−2
	3		
	4		
S10−19	5	PINCH SOL Ⓑ	P451−5
S10−20A	6	T BRAKE SOL Ⓒ	P451−6
S10−20B	7	PINCH SOL Ⓒ	P451−7
S10−21	8	T BRAKE SOL Ⓑ	P451−8
S10−22	9	S BRAKE SOL Ⓑ	P451−9
S10−23B	10	S BRAKE SOL Ⓒ	P451−10

To CHASSIS INTERMADIATE

P54			
S10−27	1	ELEVATOR Ⓜ⊕	P406−4
S10−28	2	ELEVATOR Ⓜ⊖	P406−5
S10−29	3	LOADING Ⓜ⊕	P452−1
S10−30	4	LOADING Ⓜ⊖	P452−2
S10−6	5	+24V	P452−3
S10−3	6	+5V	P452−4
S10−3	7	+5V	P452−5
S10−1	8	GND	P452−6

62		
1	Y… SW	P14-1
2	GND	P14-2
3	C HEAD SW	P14-3
4	GND	P14-4
5	M…	P14-12
6	F… Ⓛ	P14-11
7	S… H Ⓗ	P14-10
8	PCM DET Ⓛ	P25-6

S9

ER

P63		
1	LI… UT (CH3)	P14-7
2	G…	P14-8
3	LI… UT (CH4)	P14-9
4	GN…	P14-10

S-6	AUDIO					
B		NO	A			
P68-8, 9, 10	GND	1	GND	POWER 4-3, 4		
S5-2A	+5V	2	+5V	S9-2B		
S5-3A	+12V	3	+12V	S9-3B		
S5-4A	+12V	4	+12V	S9-4B		
S5-5A	+24V	5	+24V	S9-5B		
P75-5	—	6	T/C GND	P69-1	P75-1	
	—	7	TC CUE OUT	P69-2	P75-2	
	GND	8	GND	CN5-1		
	—	9	R/P HEAD ⊕ (T/C)	CN5-3		
	—	10	R/P HEAD ⊖ (T/C)	CN5-2		
	T/C GND	11	T/C GND			
	—	12	R/P HEAD ⊕ (CH1)	CN1-1		
	—	13	R/P HEAD ⊖ (CH1)	CN1-2		
	(GND)	14	(GND)	CN1-3		
P67-3	METER (CH1)	15	CUE Ⓗ	P78-10	P69-5	P67-9
P67-4	(GND)	16				
P67-5	PB VR ⊕ (CH1)	17	LINE OUT (CH1)	P52-1	P66-4	
P67-6	PB VR ⊖ (CH1)	18	(GND)	P52-2	P66-5	
P67-7	MONI OUT (CH1)	19				
P67-8	(GND)	20	ATT (1)	P76-1		
P78-4	LOADING MUT Ⓛ	21	ATT (2)	P76-2		
P59-2	NR ON Ⓛ	22	MUT Ⓗ	P71-6	P66-8	
P70-2	(GND)	23	DOC OUT (CH1)	P70-1		
P70-3	DEC IN (CH1)	24	(GND)	P70-4		
P70-6	(GND)	25	DEC OUT (CH2)	P70-5		
P70-7	DEC IN (CH2)	26	(GND)	P70-8		
		27				
	GND	28	GND			
	—	29	R/P HEAD ⊕ (CH2)	CN3-1		
	—	30	R/P HEAD ⊖ (CH2)	CN3-2		
	(GND)	31	(GND)	CN3-3		
P68-3	METER (CH2)	32				
P68-4	(GND)	33	EXT NR Ⓛ	P70-9		
P68-5	PB VR ⊕ (CH2)	34	EXT NR ON Ⓛ	P87-8		
P68-6	PB VR ⊖ (CH2)	35	LINE OUT (CH2)	P52-3	P66-6	
P68-7	MONI OUT (CH2)	36	(GND)	P52-4	P66-7	
S5-37A	−5V	37	−5V	S9-37B		
S5-38A	−12V	38	−12V	S9-38B		
P68-8	GND	39	GND	POWER 4-3, 4		
S5-40A	GND	40	GND	POWER 4-3, 4		

To A/C HEAD

CN1		
S6-12	1	R/P HEAD ⊕ (CH1)
S6-13	2	R/P HEAD ⊖ (CH1)
S6-14	3	(GND)

To A/C HEAD

CN3		
S6-29	1	R/P HEAD ⊕ (CH2)
S6-30	2	R/P HEAD ⊖ (CH2)
S6-31	3	(GND)

To L0

P64			
S9-8	1	MR CTL	P28-1
S9-9	2	GND	P28-2
S9-26A	3	FG1	P22-1
S9-26B	4	FG2	P22-2
S9-25B	5	GND	P22-3
S9-24A	6	REF H SW	P14-5
S9-25A	7	GND	P14-6
S9-17A	8	PB FRAME 2	P26-7
S9-15	9	GND	P26-10
S9-16B	10	Y PB SYNC	P26-9
S9-15	11	GND	P26-12
S9-16A	12	C PB SYNC	P26-11

To L0 (L6)

P75			
S6-6A	1	(T/C GND)	P27-1
S6-7A	2	T/C CUE OUT	P27-2
S6-3	3	S+12V	P32-5
S6-5	4	+24V	P32-6
S6-7B	5	(T/C GND)	P27-3
S9-6AB	6	UNREG GND	P32-8
S9-6AB	7	UNREG GND	P32-9
S6-5	8	+24V	P32-7

To A/C HEAD

CN5		
S6-8	1	GND
S6-10	2	R/P HEAD ⊖ (T/C)
S6-9	3	R/P HEAD ⊕ (T/C)

J13

To PEAK METER

P66			
S6-4	1	+12V	P1-1
S6-39	2	GND	P1-2
S6-38	3	−12V	P1-3
S6-17A	4	LINE OUT (CH1)	P2-1
S6-18A	5	(GND)	P2-2
S6-35A	6	LINE OUT (CH2)	P2-3
S6-36A	7	(GND)	P2-4
S6-22A	8	MUT Ⓗ	P2-5

S − 9	AT			
B		NO	A	
S5-1A	−	1	GND	
S6-2A	−	2	+5V	S10−3B
S6-3A	−	3	+12V	S10−5B
S6-4A	−	4	+12V	S10−5B
S6-5A	−	5	+24V	S10−6B
	−	6	UNREG GND	S10−24
	−	7		
P64−1	−	8	MR CTL	
P64−2	−	9	GND	
		10		
		11		
		12		
		13		
		14		
P64−9,11	−	15	GND	
P64−10	Y PB SYNC	16	C PB SYNC	P64−12
		17	PB FRAME 2	P64−8
		18		
		19		
		20		
P77-1	HCONT 1	21	$\overline{\text{STILL POS-F}}$	P74−3
P77-2	HCONT 2	22	$\overline{\text{STILL POS-R}}$	P74−4
P77-3	HCONT 3	23		
P77-4	HCONT 4	24	AT REF H SW	P64−6
P64−5	−	25	GND	P64−7
P64−4	FG2	26	FG1	P64−3
		27		
P77-5	DRUM SERVO Ⓛ	28	AT AK Ⓛ	P74−5
P74−6	AT ON Ⓛ	29	PINCH ON Ⓛ	P74−9
P74−7	NORM PLAY Ⓛ	30	AT EJECT Ⓛ	P74−8
		31		
	GND	32	C RF	S4-7A
S5-22B	−	33	C AT RF IN	S5-22A
S5-22B	−	34	GND	
S3 −9	C DO PLS	35	Y DO PLS	S4 −9A
		36		
S6-37A	−	37	−5V	S10−36B
S6-38A	−	38	−12V	S10−37B,38B
S5-39A	−	39	GND	S10−39B
S5-40A	−	40	GND	S10−40B

S − 10		POWER & DRIVE				
B			NO	A		
S9-1A		−	1	GND	P54-8	
		−	2	GND		
S9 −2A		−	3	+5V	P54-6, 7	P65-1
POWER5−5		−	4	REG +12V Ⓛ	P73-1	
S9 −3A,4A		−	5	REG +12V Ⓢ	P68-1, P71-3	P65-2
S9−5A	POWER 3-1	−	6	+24V	P54−5, P73-3	P65-9
POWER4−1		−	7	+14V		
POWER4−2		−	8	+14V		
POWER4−7		−	9	+7V		
		−	10			
		−	11	S REEL MOTOR ⊕	P53−1	
		−	12	S REEL MOTOR ⊖	P53−2	
P76−3		S REEL MOTOR ①	13			
P76−4		S REEL MOTOR ②	14			
		−	15			
		−	16			
P76−10		PINCH SOL Ⓗ	17			
P78-6		T BRAKE SOL Ⓗ	18	S BRAKE SOL Ⓗ	P76−9	
		−	19	PINCH SOL Ⓑ	P53−5	
P53−7		PINCH SOL Ⓒ	20	T BRAKE SOL Ⓒ	P53−6	
		−	21	T BRAKE SOL Ⓑ	P53−8	
		−	22	S BRAKE SOL Ⓑ	P53−9	
P53−10		S BRAKE SOL Ⓒ	23			
POWER 3-2		−	24	UNREG GND	P73-4	P75-6, 7
P76−6		LOADING 2 Ⓗ	25	LOADING 1 Ⓗ	P76−5	
P76−8		LOADING 4 Ⓗ	26	LOADING 3 Ⓗ	P76−7	
		−	27	ELEVATOR Ⓜ⊕	P54−1	
		−	28	ELEVATOR Ⓜ⊖	P54−2	
		−	29	LOADING Ⓜ⊕	P54−3	
		−	30	LOADING Ⓜ⊖	P54−4	
		−	31	GND (MOTOR)		
			32			
POWER4−6		−	33	−7V		
POWER4−5		−	34	−14V		
POWER4−5		−	35	−14V		
S9 −37A		−	36	−5V	POWER 5-2	
S9 −38A		−	37	REG −12V	P68-2	P65-4, 10
S9 −38A		−	38	REG −12V	P71-4	
S9 −39A		−	39	GND	P71-5	
S9 −40A		−	40	GND		

…T (CH…)	P320-1
	P320-2
…T (CH2)	P320-3
	P320-4
…T (CH3)	P357-1
	P357-2
…T (CH4)	P357-3
	P357-4

P69			
S6-6A	1	(T/G GND)	P301-5
S6-7A	2	T/C CUE OUT	P301-6
S6-4AB	3	+12V	P301-4
S3-38AB	4	−12V	P301-5
S6-15A	5	CUE Ⓗ	P301-7
S6-6A	6	T/C GND	P301-3

TO JACK (T/C OUT)

P70			
S6-23A	1	DEC. OUT (CH1)	
S6-23B	2	(GND)	
S6-24B	3	DEC. IN (CH1)	
S6-24A	4	(GND)	
S6-25A	5	DEC. OUT (CH2)	
S6-25B	6	(GND)	
S6-26B	7	DEC. OUT (CH2)	
S6-26A	8	(GND)	
S6-33A	9	EXT NR Ⓛ	
	10		

TO JACK (EXT NR CONNECTOR)

J3

P71			
POWER3-1	1	+24V	P331−1
POWER3-2	2		P331−3
S10−5	3	+ 14	P359−2
S10−38	4	− 14	P359−3
S10−39	5	GND	P359−4
S6 −22A	6	MUT Ⓗ	P359−1

To AUDIO MAIN

POWER 3			
S10-6	1	+24V	P211−1
S10-24	2		P211−2

To POWER BOX

J3

P72			
POWER3-1	1	+24V	P212−1
P78-7	2	FAN STOP Ⓛ	P212−2
POWER3-2	3		P212−3

To POWER BOX

POWER 4			
S10−7	1	+14V	P213−1
S10−8	2	+14V	P213−2
	3	GND	P213−3
	4	GND	P213−4
S10−34,35	5	−14V	P213−5
S10−33	6	−7V	P214−6
S10−9	7	+7V	P214−7

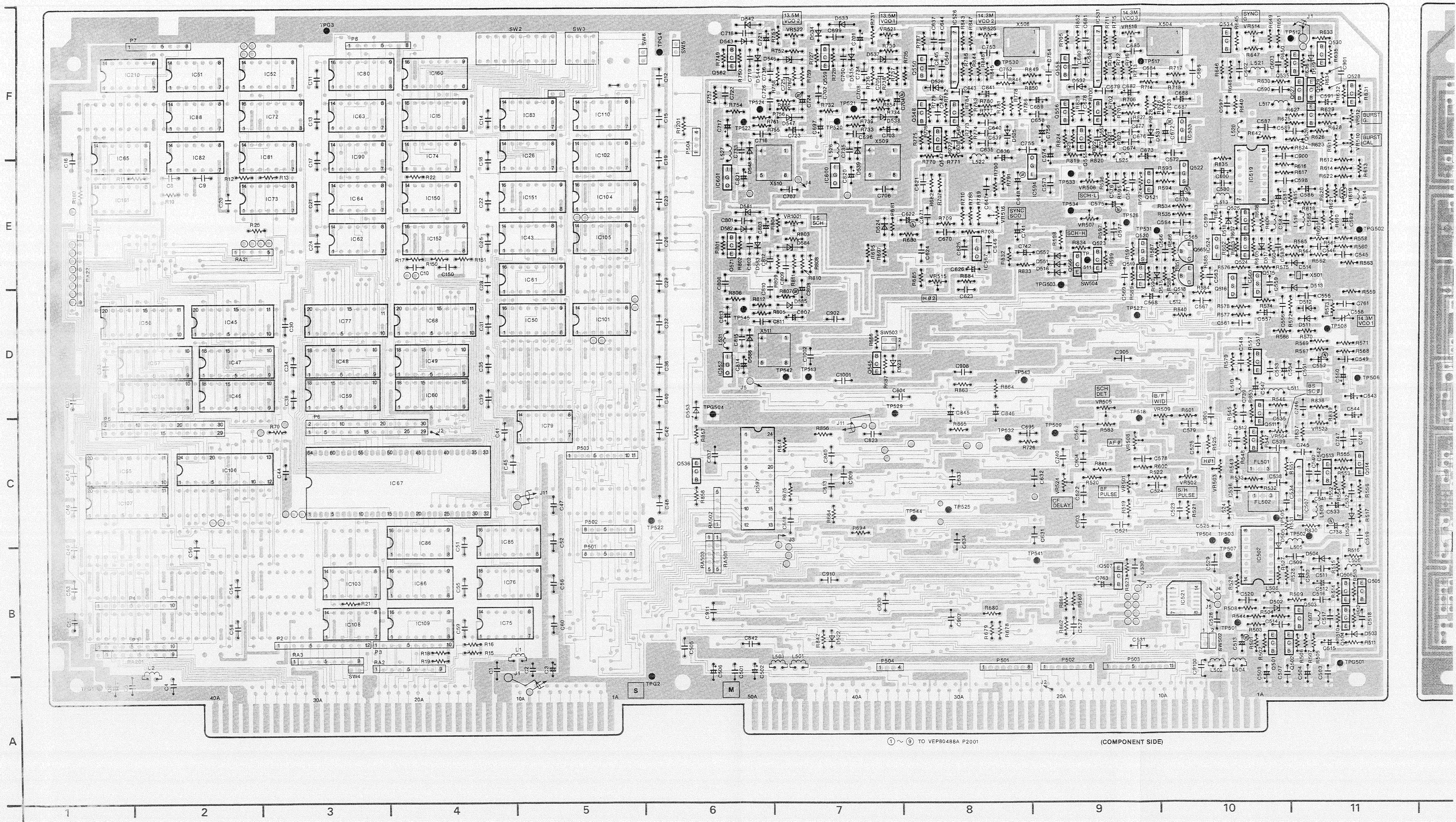
To POWER BOX

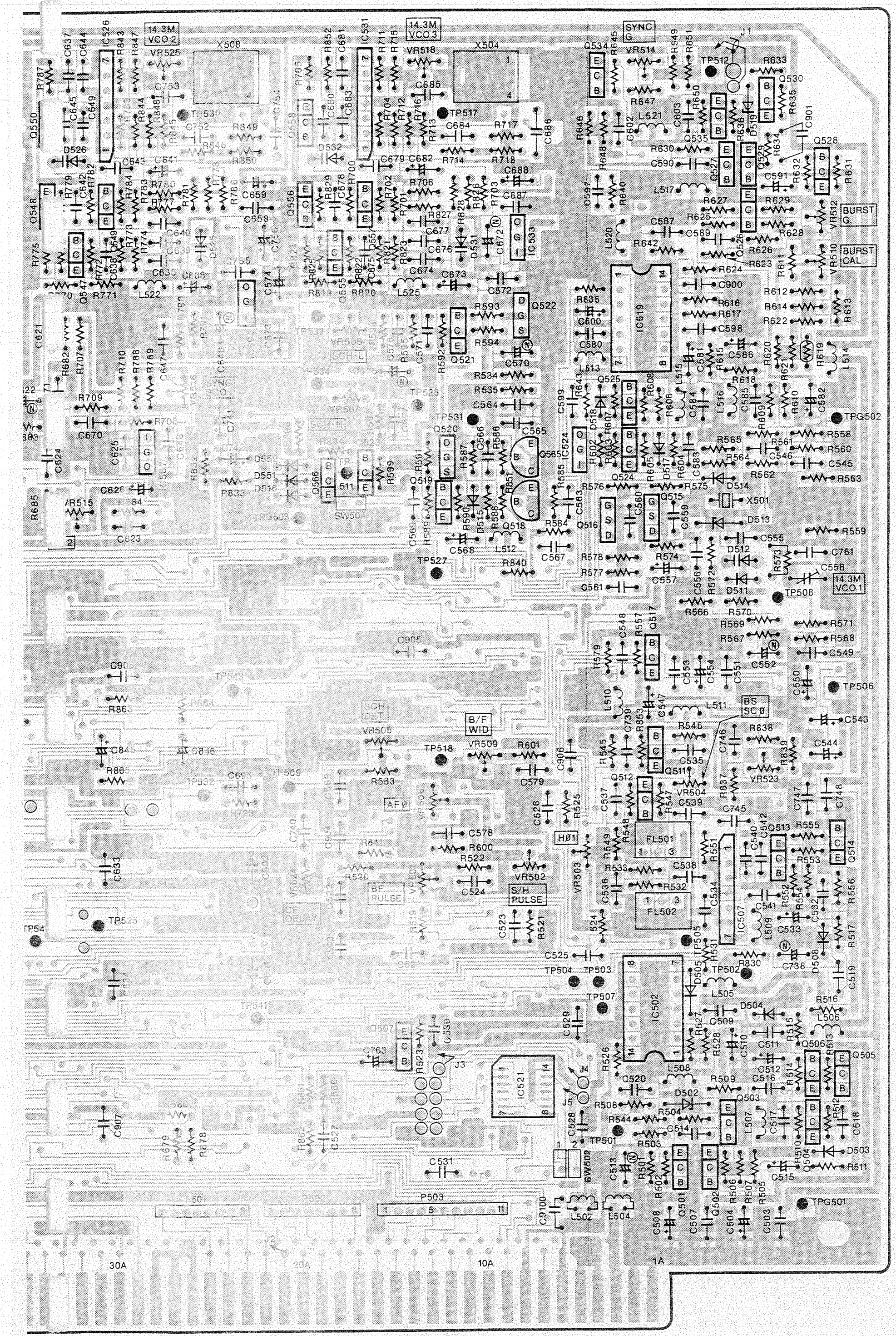
C1 25V/100
25V/100 C2
C4 16V/100
C3 16V/100

REVERSE SIDE

L1 TBC 1 & SYNC
GEN. P.C.B.

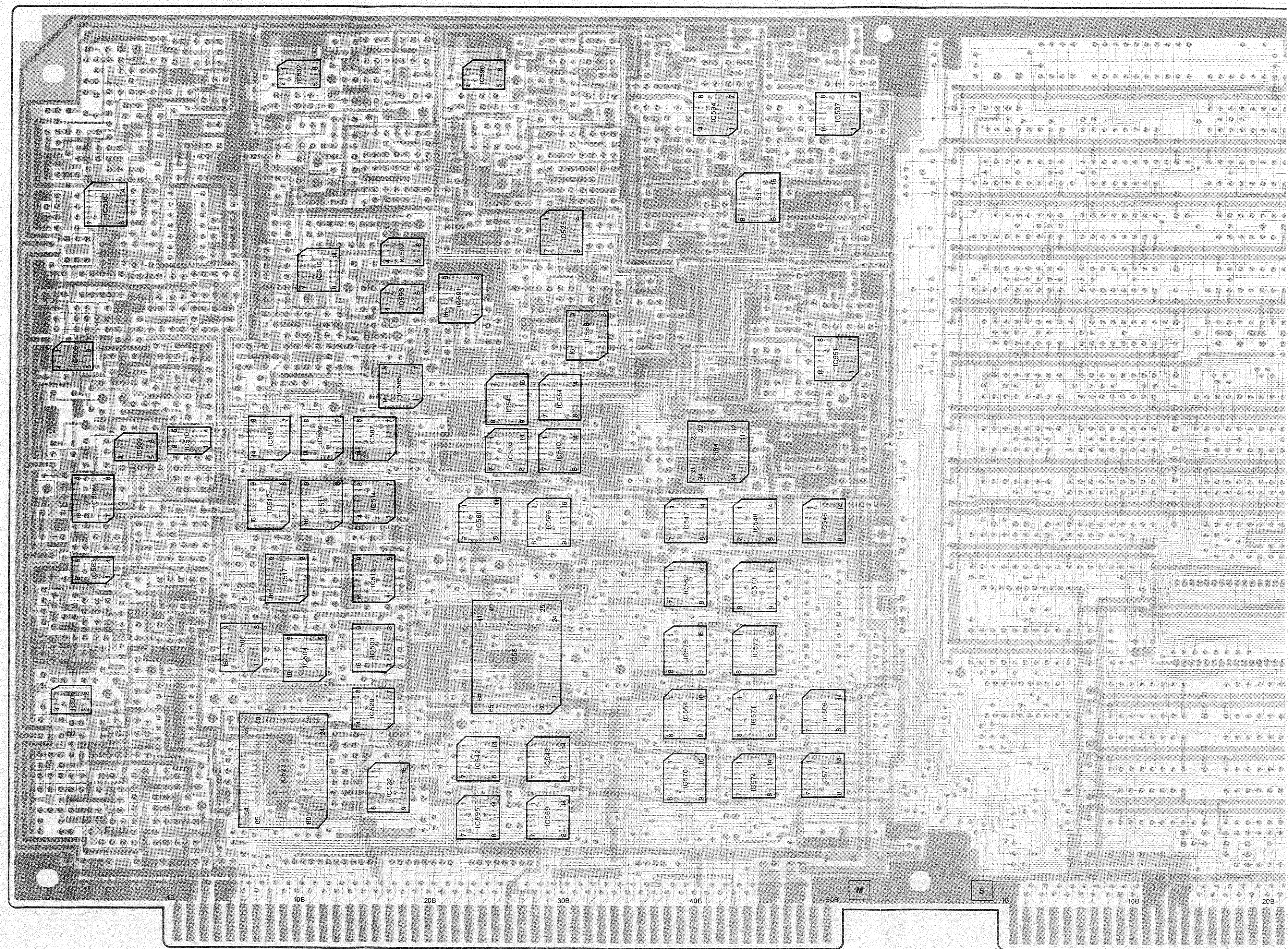
L1 TBC 1 & SYNC GENERATOR P.C. BAORD (VEP88039A)





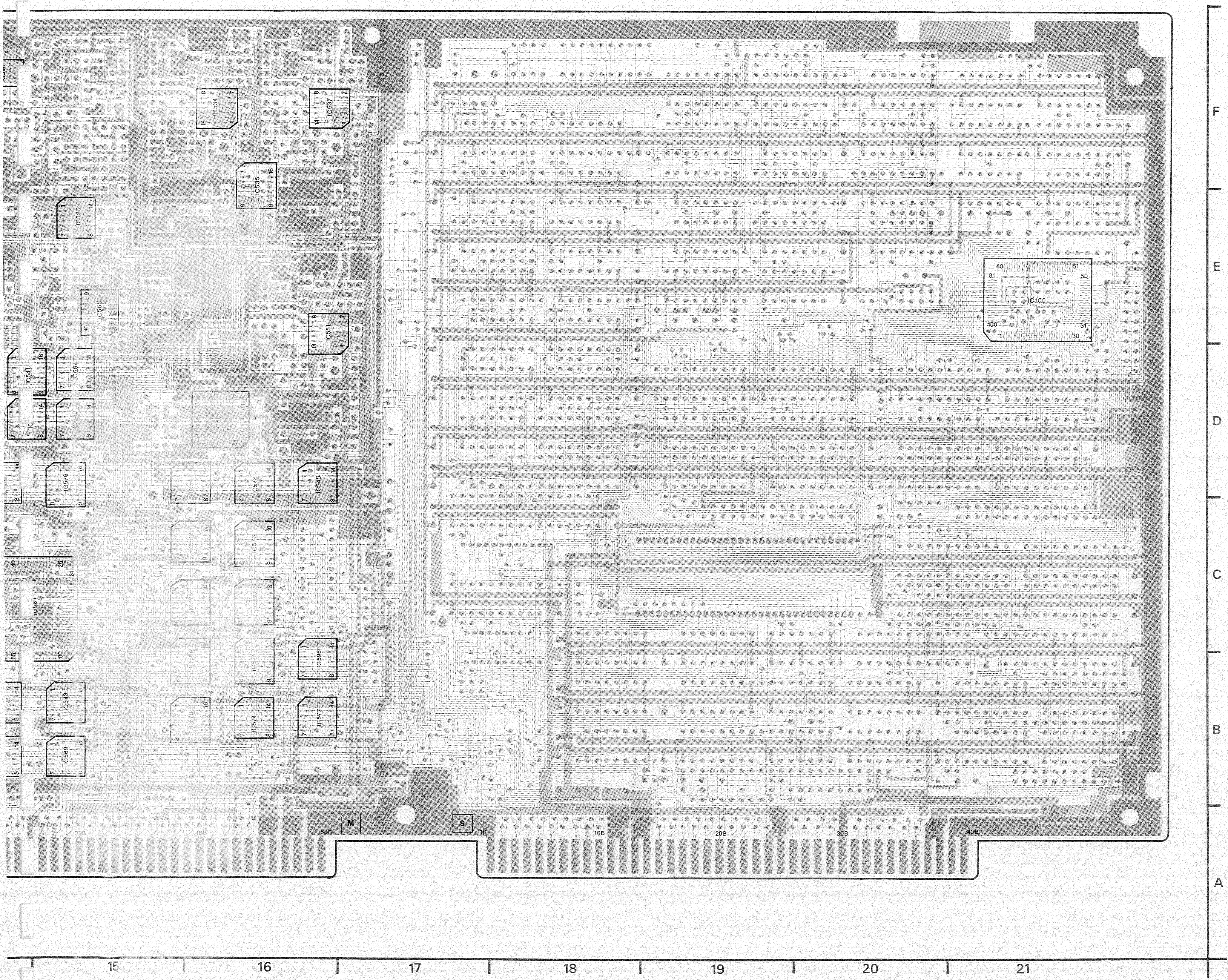
(9) TO VEP80488A P2001

(COMPONENT SIDE)



(FOIL SIDE)

8	9	10	11	12	13	14	15	16	17	18	19



TBC 1 & SYNC GEN. (L1)

Transistors

Q501	B-10
Q502	B-10
Q503	B-11
Q504	B-11
Q505	B-11
Q506	B-11
Q507	B-9
Q511	C-10
Q512	C-10
Q513	C-11
Q514	C-11
Q515	E-10
Q516	D-10
Q517	D-10
Q518	E-10
Q519	E-9
Q520	E-9
Q521	E-9
Q522	E-10
Q523	E-9
Q524	E-10
Q525	E-10
Q526	F-11
Q527	F-11
Q528	F-11
Q529	F-11
Q530	F-11
Q534	F-10
Q535	F-10
Q536	C-6
Q537	D-7
Q545	D-7
Q547	F-8
Q548	F-8
Q549	F-8
Q550	F-8
Q555	F-9
Q556	F-9
Q557	F-9
Q558	F-9
Q562	F-6
Q565	E-10
Q566	E-9
Q571	E-6
Q599	F-7

Integrated Circuits

IC15	F-4
IC26	F-5
IC43	E-5
IC45	D-2
IC46	D-2
IC47	D-2
IC48	D-3
IC49	D-4
IC50	D-5
IC51	F-2
IC52	F-3
IC55	C-1
IC56	D-2
IC57	D-2
IC58	D-2
IC59	D-3
IC60	D-4
IC61	E-5
IC62	E-3
IC63	F-3
IC64	E-3
IC65	F-1
IC66	B-4
IC67	C-4
IC68	D-4
IC72	F-3
IC73	E-3
IC74	F-4
IC75	B-4
IC76	B-4
IC77	D-3
IC79	C-5
IC80	F-3
IC81	F-3
IC82	F-2
IC83	F-5
IC85	C-4
IC86	C-4
IC88	F-2
IC90	F-3
IC100	E-21
IC101	D-5
IC102	F-5
IC103	B-3
IC104	E-5
IC105	E-5
IC106	C-2
IC107	C-1
IC108	B-3
IC109	B-4
IC110	F-5
IC150	E-4
IC151	E-5
IC152	E-4
IC160	F-4
IC161	E-1
IC210	F-1
IC501	C-12
IC502	B-10
IC503	C-14
IC504	C-13
IC505	C-13
IC506	E-12
IC507	C-11
IC508	D-12
IC509	D-12
IC510	D-13
IC511	D-13
IC512	D-13
IC513	C-14
IC514	D-14
IC515	E-13
IC517	C-13
IC518	E-12
IC519	E-10
IC520	B-14
IC521	B-10
IC522	B-14
IC523	B-13
IC524	E-10
IC525	E-15
IC526	F-8
IC531	F-9
IC532	F-13
IC533	F-10
IC534	F-16
IC535	F-16
IC537	F-16
IC539	D-15
IC540	D-15
IC541	D-15
IC542	B-14
IC543	B-15
IC545	D-16
IC547	D-16
IC548	D-16
IC551	E-16
IC552	D-6
IC554	D-15
IC560	D-14
IC562	C-16
IC564	B-16
IC565	D-14
IC567	E-8
IC568	E-15
IC569	B-15
IC570	B-16
IC571	B-16
IC572	C-16
IC573	C-16
IC574	B-16
IC575	C-16
IC576	C-15
IC577	B-16
IC581	C-15
IC583	C-12
IC584	D-16
IC585	D-14
IC586	D-13
IC587	D-14
IC588	D-13
IC590	F-14
IC591	E-14
IC592	E-14
IC593	E-14
IC594	E-9
IC595	B-14
IC596	B-16
IC597	C-6
IC600	E-7
IC601	E-6

Test Points

TP501	B-10
TP502	C-11
TP503	C-10
TP504	C-10
TP505	C-10
TP506	D-11
TP507	B-10
TP508	D-11
TP509	C-9
TP511	E-9
TP512	F-10
TP513	D-7
TP517	F-9
TP518	C-9
TP520	F-7
TP521	F-7
TP522	C-6
TP523	F-6
TP524	F-6
TP525	C-8
TP526	E-9
TP527	D-9
TP528	D-9
TP529	C-7
TP530	F-8
TP531	E-9
TP533	E-9
TP534	E-9
TP541	B-8
TP542	D-7
TP543	D-8
TP544	C-8
TP545	D-6
TPG1	A-1
TPG2	A-6
TPG3	F-3
TPG4	F-6
TPG501	B-11
TPG502	E-11
TPG503	D-9
TPG504	C-6

Adjustments

VR501	C-9
VR502	C-10
VR503	C-10
VR504	C-10
VR505	D-9
VR506	E-9
VR507	E-9
VR508	C-9
VR509	D-9
VR510	F-11
VR512	F-11
VR514	F-10
VR515	E-8
VR516	E-8
VR518	F-9
VR521	F-7
VR522	F-7
VR523	C-11
VR524	C-9
VR525	F-8
VR1001	E-7
C558	D-11

ADDRESS INFORMATION

L1 TBC 1 & SYNC GENERATOR SCHEMATIC DIAGRAM (1/2) (TBC 1)

L-1M	TBC 1			
B		NO	A	
		1	GND	L2M-1B
		2	GND	L2M-2B
		3	-5V	L2M-3B
		4	–12V	L2M-4B
		5	–12V	L2M-5B
P12-3	REF VIDEO	6	GND	P12–4
P17-4	SYS·SC COARSE (1)	7	SYS·SC COARSE (2)	P17–5
L3M-6B	YR CLK	8	GND	L3M-6A
L3M-9B	VØ1 Ⓛ	9	RD HD	L6M-21B
L3M-10B	R BLK	10	RBF	L3M-10A
L3M-11B	R SYNC	11	VØ2	L3M-11A
L3M-12B	Y 8	12	Y 7	L3M-12A
L3M-13B	Y 6	13	Y 5	L3M-13A
L3M-14B	Y 4	14	Y 3	L3M-14A
L3M-15B	Y 2	15	Y 1	L3M-15A
L3M-16B	GND	16	Y 9	L3M-16A
L3M-17B	PR8	17	PR7	L3M-17A
L3M-18B	PR6	18	PR5	L3M-18A
L3M-19B	PR4	19	PR3	L3M-19A
L3M-20B	PR2	20	PR1	L3M-20A
L3M-21B	Y DOP Ⓛ	21	COUNT Ⓗ	L2M-21A
L3M-22B	PB8	22	PB7	L3M-22A
L3M-23B	PB6	23	PB5	L3M-23A
L3M-24B	PB4	24	PB3	L3M-24A
L3M-25B	PB2	25	PB1	L3M-25A
L3M-26B	GND	26	GND	L3M-26A
L3M-27B	R-4SC OUT	27	GND	L3M-27A
L3M-28B	R-SC OUT	28	GND	L3M-28A
L3M-29B	PAL SW	29	[illegible] LINE P	L3M-29A
		30	GND	
P17-7	SYS-HØ	31	SYS SC [illegible]	P17–8
	GND	32	R-VD OUT	L6M-22B
L2M-8B	R-FRAMING OUT	33	GND	L2M-8A
L2M-30A	PBV	34	R 2fH	L2M-10A
L5M-30A	25Hz OUT	35		
L5M-30B	GND	36	CNC ON Ⓛ	P17–6
		37		
L1M-39A	INCOME 25Hz	38	REF DET Ⓛ	L6S-5B
		39	REF 25Hz	L1M-38B
L3M-33B	GND	40		
L6M-28B	ADV Ⓛ1 IN	41	ADV Ⓛ2 IN	L6M-28A
L6M-30A	R/P HEAD Ⓛ IN	42	TAPE R/P Ⓛ IN	L6M-29B
L3M-40B	VISC CONT	43	GND	L3M-40A
		44	R[illegible]	L3M-7B
		45	+12V	L2M-45B
		46	+12V	L2M-46B
		47	+5V	L2M-47B
		48	+5V	L2M-48B
		49	GND	L2M-49B
		50	GND	L2M-50B

L-1S	TBC – 1				
B		NO	A		
	GND	1	GND	L2S-1A	
		2			
L3M-35B	TBC CF	3	REF CF	L5S-15A	
P36–2	VIDEO Ø1	4	VIDEO Ø2	P36–3	
P36–4	VIDEO Ø3	5	EXT	L6M-48A	
		6	REF SCH	L6S-10A	
L6M-22A	TC CF	7	CF SELECT 1	L6S-2A	
L6S-3A	CF SELECT 2	8	CF SELECT 3	L6S-4A	
L3S-9B	4LP	9	BS OUT	P12–9	
	GND	10	HD	P39–10	
	–	11	GND	P12–10	L2S-11B
	–	12	GND	L2S-12B	
	–	13	+5V	L2S-15B	
	–	14	+5V	L2S-16B	
P17–1	SCH Ø	15	VIDEO Ø4	P36–5	
P17–2	SCH COARSE (1)	16	SCH COARSE(2)	P17–3	
	GND	17	COMON Ⓛ	L2M-29A	
	GND	18	BLK ON Ⓛ	L2M-34A	
		19	E-E Ⓛ	L2M-44A	
L2M-43A / L6M-35B	SEARCH Ⓛ	20	EJECT TAPE Ⓛ	L6M-34B	
	GND	21	ADV CONT Ⓗ	L6M-36A	
L2M-27A	Y DOC	22	C DOC	L2M-28A	
L2S-22A	PR WZERO	23	PB WZERO	L2S-23A	
	GND	24	Y WZERO	L2S-24A	
L3S-25B	–	25	GND	L2S-25A	
L3S-26B	C DATA 8	26	C DATA 7	L3S-26A	
L3S-27B	C DATA 6	27	C DATA 5	L3S-27A	
L3S-28B	C DATA 4	28	C DATA 3	L3S-28A	
L3S-29B	C DATA 2	29	C DATA 1	L3S-29A	
L3S-30B	–	30	GND	L3S-30A	
L3S-31B	Y DATA 8	31	Y DATA 7	L3S-31A	
L3S-32B	Y DATA 6	32	Y DATA 5	L3S-32A	
L3S-33B	Y DATA 4	33	Y DATA 3	L3S-33A	
L3S-34B	Y DATA 2	34	Y DATA 1	L3S-34A	
L2S-35B	Y WCK	35	Y DATA 9	L3S-35A	
L2S-36B	GND	36	C WCK	L2S-36A	
POWER1–1	–	37	+5V	L2S-38B	
POWER1–2	–	38	+5V	L2S-38B	
	–	39	GND	L2S-39B	
	–	40	GND	L2S-40B	

POWER 1			
L1S–37B POWER2-1	1	+5V	P214-7
L1S–38B POWER2-2	2	+5V	P214-6
	3	GND	P214-5
	4	GND	P214-4
	5	GND	P214-3

To POWER BOX

P11			
	1	+5V	P215-1
	2	GND	—
	3	GND	P215-2

To POWER BOX

To FRONT PANEL

P4			
POWER1-1	1	+5V	P126-1
POWER1-1	2	+5V	P126-2
POWER1-1	3	+5V	P126-3
	4	GND	P126-4
	5	GND	P126-5
	6	GND	P126-6

P12			
	1		
	2		
L1M-6B	3	REV VIDEO	P301-9
L1M-6A	4	GND	P301-10
	5		
	6		
L3M-43A	7	WFM OUT	P308-2
L3M-43B	8	GND	P308-1
L1S-9A	9	BS OUT	P308-4
L1S-11A	10	GND	P308-3

To JACK

To FRONT

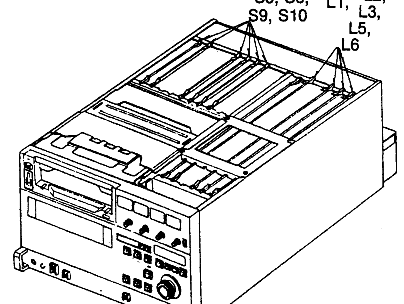
P17			
L1S-15B	1	SCH Ø	P114-1
L1S-16B	2	SCH COARSE(1)	P114-2
L1S-16A	3	SCH COARSE(2)	P114-3
L1M-7B	4	SYS-SC-COARSE (1)	P101-3
L1M-7A	5	SYS-SC-COARSE (2)	P101-4
L1M-36A	6	CNC ON Ⓛ	P114-5
L1M-31B	7	SYS H Ø	P101-1
L1M-31A	8	SYS SC Ø	P101-12
L2M-33A	9	YC DELAY	P134-5
	10	GND	P134-7

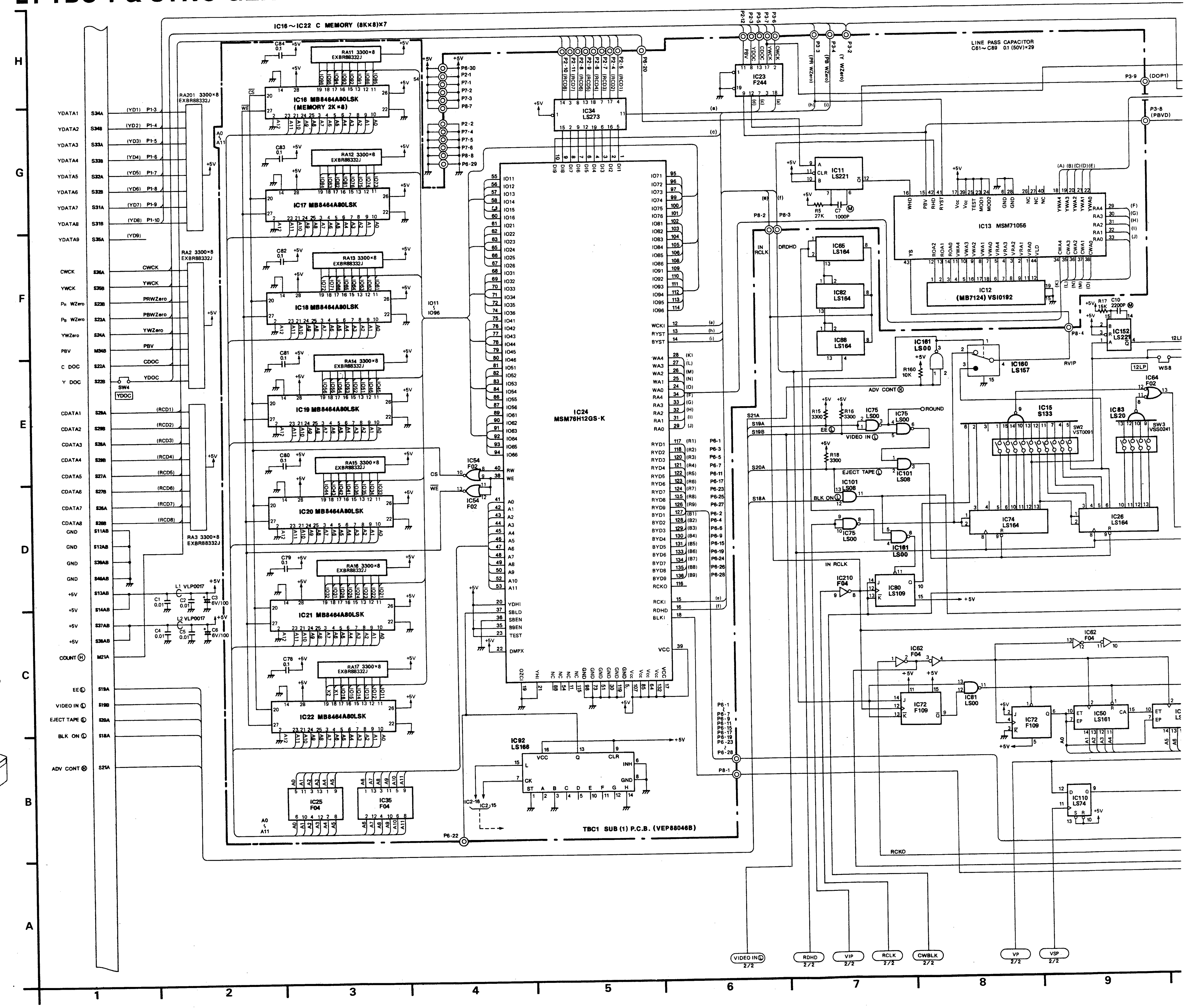
To FRONT

P36			
L3S-3B	1	B/W Ⓛ	P114-4
L1S-4B	2	VIDEO Ø1	P106-8
L1S-4A	3	VIDEO Ø2	P106-9
L1S-5B	4	VIDEO Ø3	P106-10
L1S-15A	5	VIDEO Ø4	P108-10
L3S-6B	6	BURST GAIN	P108-3
L3S-6A	7	SYNC GAIN	P108-2
L3S-7B	8	WFM D	P106-7
L3S-8B	9	WFM E	
L6S-24B	10	PCM ON Ⓛ	

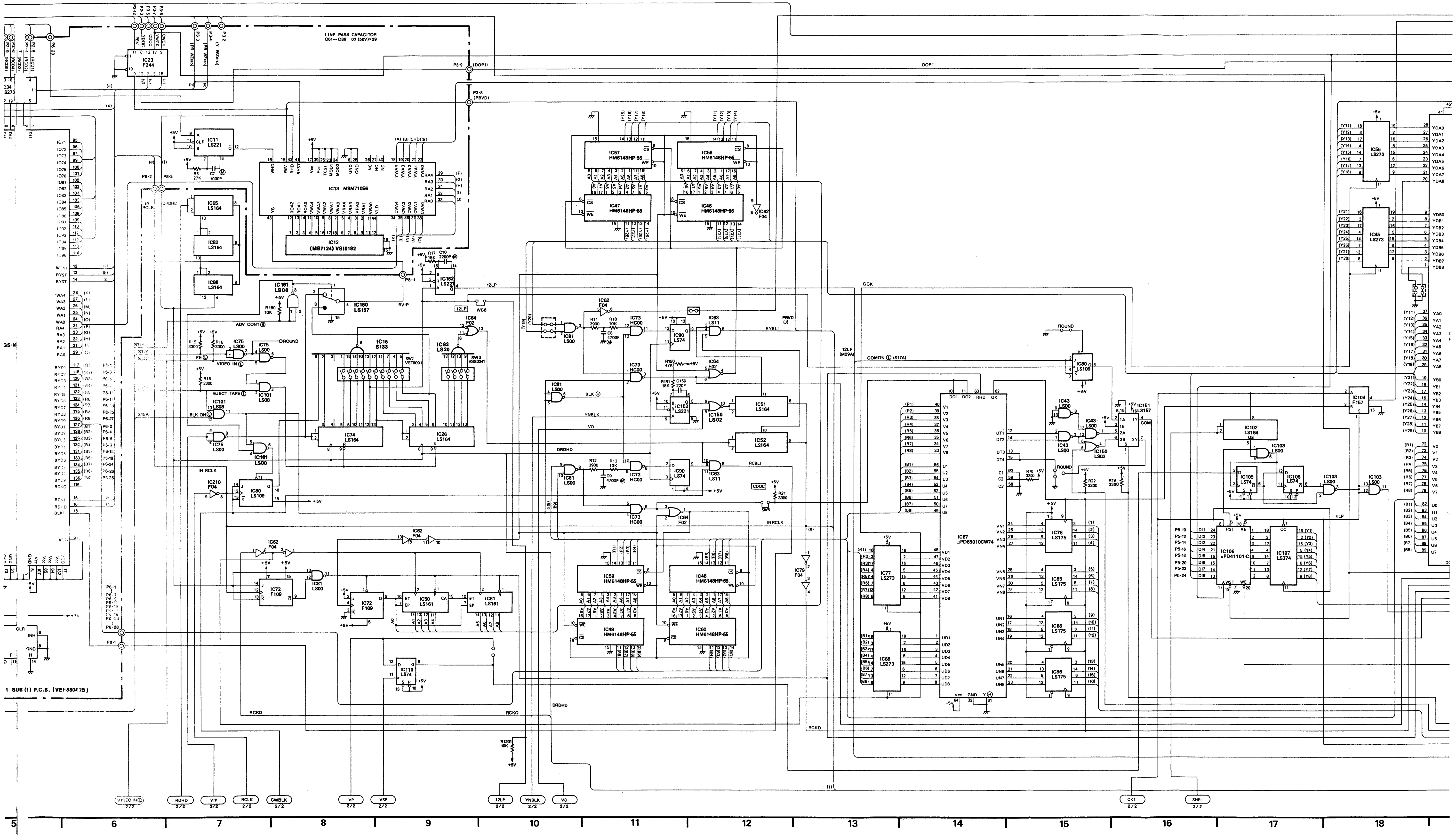
P39			
L5M-45B	1	PCM H SW	
L5M-46B	2	PCM GATE	
	3	GND	
L6S-21A	4	PCM EE1	
L6S-22A	5	PCM EE2	
L6S-23A	6	STBY Ⓛ	
L6S-24A	7	PLAY Ⓛ	
L6M-30A	8	R/P HEAD	
L6M-29B	9	TAPE R/P	
L1S-10A	10	HD	
	11	GND	
L6S-25B	12	POWER ON Ⓛ	

To JACK





G AM (1/2) (TBC 1)


LINE PASS CAPACITOR
C61～C89 0.1 (50V)×29
IC23 F244
IC11 LS221
IC13 MSM71056
IC12 (MB7124) VSI0192
IC65 LS164
IC82 LS164
IC88 LS164
IC161 LS00
IC160 LS157
IC152 LS221
IC15 LS133
IC64 F02
IC83 LS20
IC74 LS164
IC26 LS164
IC75 LS00
IC101 LS08
IC161 LS00
IC80 LS109
IC210 F04
IC62 F04
IC72 F109
IC81 LS00
IC50 LS161
IC61 LS161
IC110 LS74
IC57 HM6148HP-55
IC58 HM6148HP-55
IC47 HM6148HP-55
IC46 HM6148HP-55
IC59 HM6148HP-55
IC48 HM6148HP-55
IC49 HM6148HP-55
IC60 HM6148HP-55
IC73 HC00
IC90 LS74
IC63 LS11
IC150 LS02
IC51 LS164
IC52 LS164
IC79 F04
IC77 LS273
IC68 LS273
IC67 μPD65010CW74
IC43 LS00
IC76 LS175
IC85 LS175
IC66 LS175
IC86 LS175
IC151 LS157
IC102 LS164
IC103 LS00
IC105 LS74
IC106 μPD41101-C
IC107 LS374
IC104 F157
IC56 LS273
IC45 LS273
DOP1
GCK
ROUND
COMON
RYBLI
RCBLI
ADV CONT
VIDEO IN
EJECT TAPE
BLK ON
IN RCLK
YNBLK
VD
DRDHD
RCKO
RCKD
1 SUB (1) P.C.B. (VEF88041B)
VIDEO IN 2/2
RDHD 2/2
VIP 2/2
RCLK 2/2
CWBLK 2/2
VP 2/2
VSP 2/2
12LP 2/2
YNBLK 2/2
VD 2/2
CK1 2/2
SHPI 2/2
5
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7
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11
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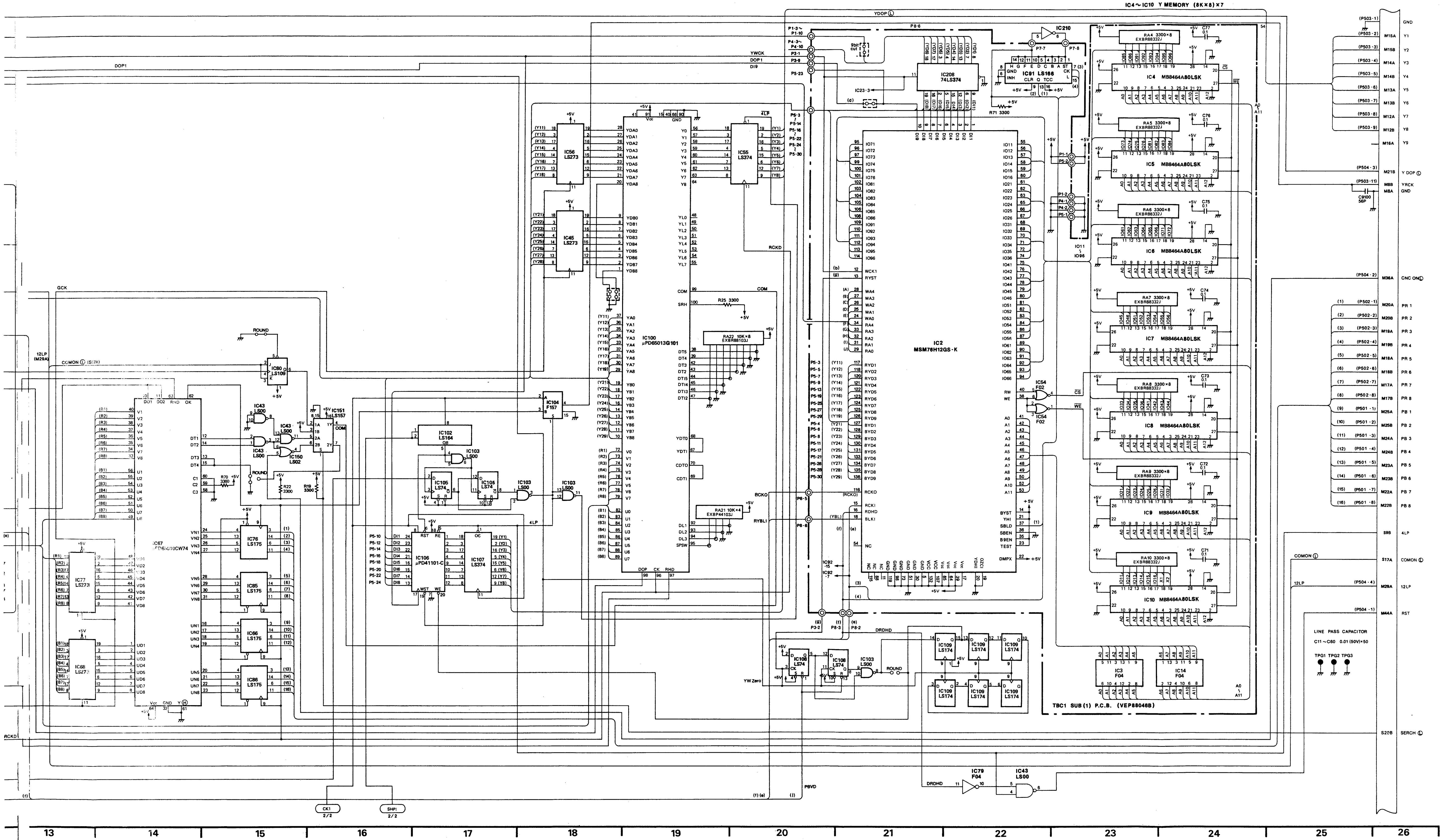
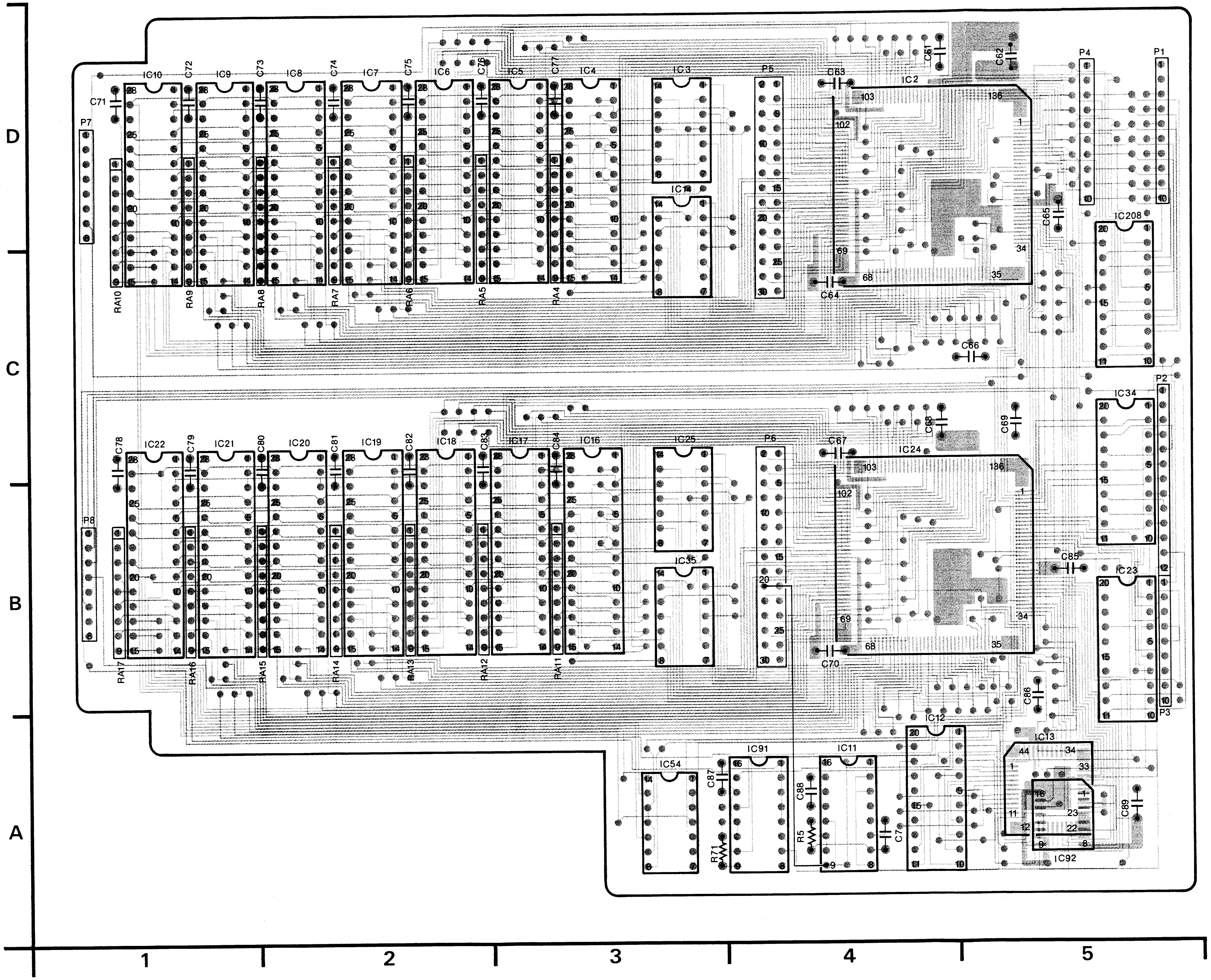
14
15
16
17
18



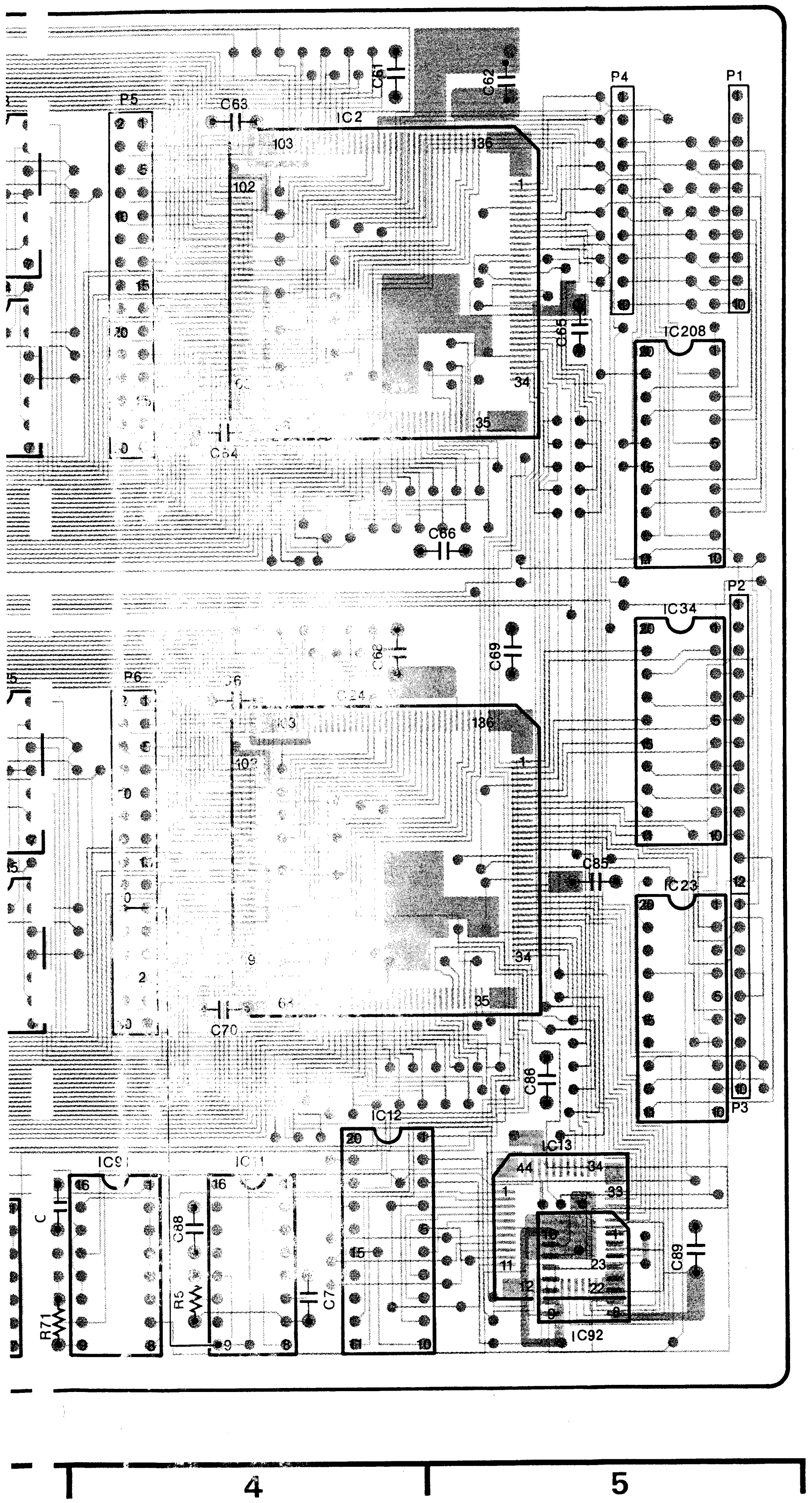
REVERSE SIDE

L1 TBC 1 SUB (1) P.C.B.

L1 TBC 1 SUB (1) P.C. BOARD (VEP88046B) (PART OF VEP88039A)



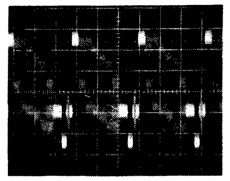
ıC ı9A)

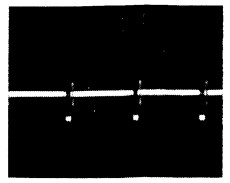


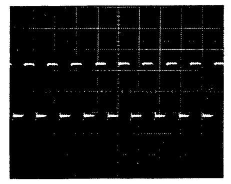
TBC 1 SUB (1)	
Integrated Circuits	
IC2	D-4
IC3	D-3
IC4	D-3
IC5	D-3
IC6	D-2
IC7	D-2
IC8	D-2
IC9	D-1
IC10	D-1
IC11	A-4
IC12	A-4
IC13	A-5
IC14	D-3
IC16	B-3
IC17	B-3
IC18	B-2
IC19	B-2
IC20	B-2
IC21	B-1
IC22	B-1
IC23	B-5
IC24	B-4
IC25	B-3
IC34	B-5
IC35	B-3
IC54	A-3
IC91	A-4
IC92	A-5
IC208	C-5

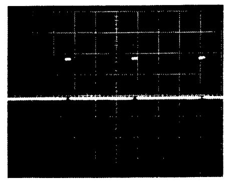
ADDRESS INFORMATION

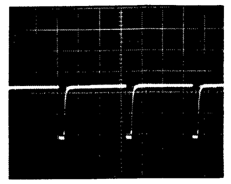
L1 TBC 1 & SYNC GEN. WAVEFORMS

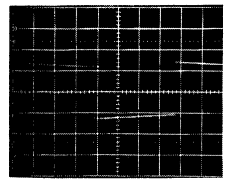

TP501
200mV/20µsec. div.

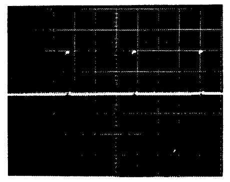

TP512
500mV/20µsec. div.

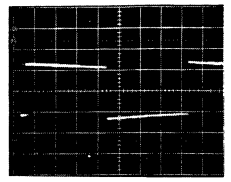

TP527
2V/20µsec. div.


TP502
2V/20µsec. div.

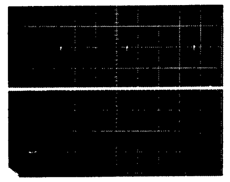

TP513
2V/20µsec. div.

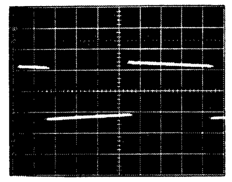

TP528
2V/20msec. div.

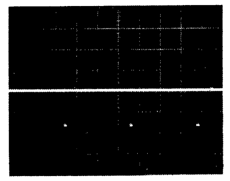

TP503
2V/20µsec. div.

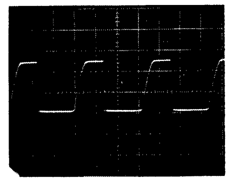

TP518 SYNC
2V/20msec. div.

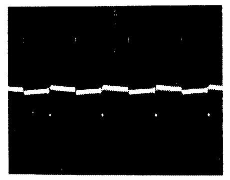

TP531
500mV/2msec. div.

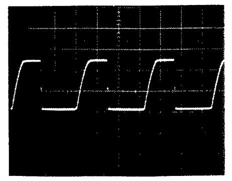

TP504
2V/20µsec. div.

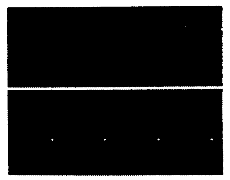

TP519
2V/20msec. div.

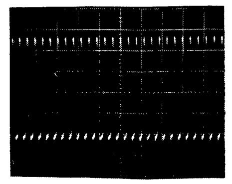

TP505
2V/20µsec. div.


TP520
2V/20µsec. div.

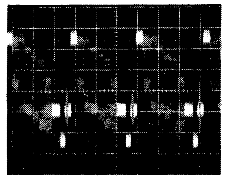

TP506
500mV/50µsec. div.


TP523
2V/20µsec. div.

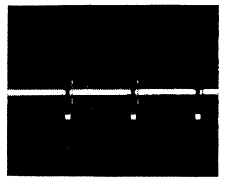

TP507
2V/50µsec. div.


TP525
1V/20µsec. div.

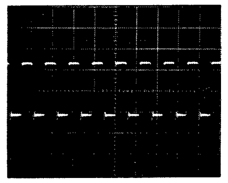
L1 TBC 1 & SYNC GEN. WAVEFORMS



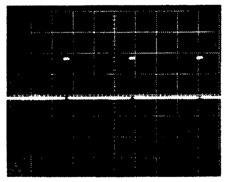
TP501
200mV/20μsec. div.



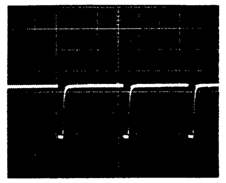
TP512
500mV/20μsec. div.



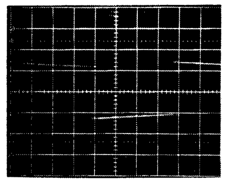
TP527
2V/20μsec. div.



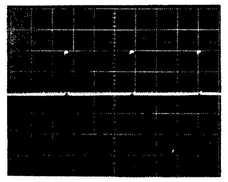
TP502
2V/20μsec. div.



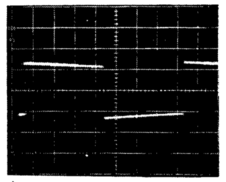
TP513
2V/20μsec. div.



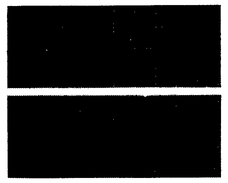
TP528
2V/20msec. div.



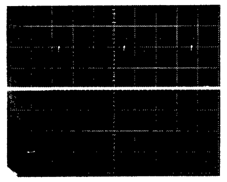
TP503
2V/20μsec. div.



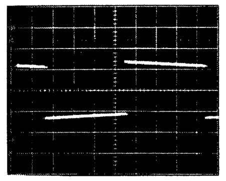
TP518 SYNC
2V/20msec. div.



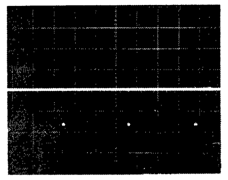
TP531
500mV/2msec. div.



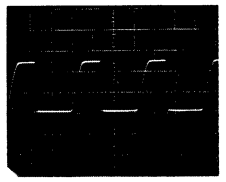
TP504
2V/20μsec. div.



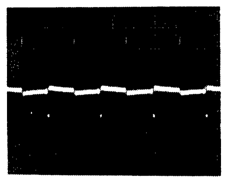
TP519
2V/20msec. div.



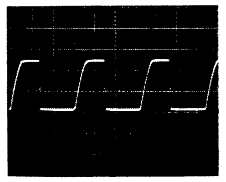
TP505
2V/20μsec. div.



TP520
2V/20μsec. div.

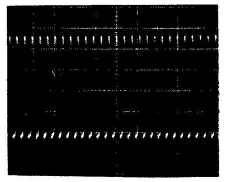


TP506
500mV/50μsec. div.



TP523
2V/20μsec. div.

TP507
2V/50μsec. div.



TP525
1V/20μsec. div.

L-1M	TBC 1			
	B	NO	A	
		1	GND	L2M-1B
		2	GND	L2M-2B
		3	5V	L2M-3B
		4	-12V	L2M-4B
		5	-12V	L2M-5B
P12-3	REF VIDEO	6	GND	P12-4
P17-4	SYS SC COARSE (1)	7	SYS SC COARSE (2)	P17-5
L3M-6B	YR CLK	8	GND	L3M-6A
L3M-9B	VØ1 (L)	9	RD HD	L6M-21B
L3M-10B	R BLK	10	RBF	L3M-10A
L3M-11B	R SYNC	11	VØ2	L3M-11A
L3M-12B	Y8	12	Y7	L3M-12A
L3M-13B	Y6	13	Y5	L3M-13A
L3M-14B	Y4	14	Y3	L3M-14A
L3M-15B	Y2	15	Y1	L3M-15A
L3M-16B	GND	16	Y9	L3M-16A
L3M-17B	PR8	17	PR7	L3M-17A
L3M-18B	PR6	18	PR5	L3M-18A
L3M-19B	PR4	19	PR3	L3M-19A
L3M-20B	PR2	20	PR1	L3M-20A
L3M-21B	Y DOP (L)	21	COUNT (H)	L2M-21A
L3M-22B	PB8	22	PB7	L3M-22A
L3M-23B	PB6	23	PB5	L3M-23A
L3M-24B	PB4	24	PB3	L3M-24A
L3M-25B	PB2	25	PB1	L3M-25A
L3M-26B	GND	26	GND	L3M-26A
L3M-27B	R-4SC OUT	27	GND	L3M-27A
L3M-28B	R-SC OUT	28	GND	L3M-28A
L3M-29B	PAL SW	29	12 LINE P	L3M-29A
		30	GND	
P17-7	SYS-HØ	31	SYS SC Ø	P17-8
	GND	32	R-VD OUT	L6M-22B
L2M-8B	R-FRAMING OUT	33	GND	L2M-8A
L2M-30A	PBV	34	R 2fH	L2M-10A
L5M-30A	25Hz OUT	35		
L5M-30B	GND	36	CNC ON (L)	P17-6
		37		
L1M-39A	INCOME 25Hz	38	REF DET (L)	L6S-5B
		39	REF 25Hz	L1M-38B
L3M-33B	GND	40		
L6M-28B	ADV (L) 1 IN	41	ADV (L) 2 IN	L6M-28A
L6M-30A	R P HEAD (L) IN	42	TAPE R/P (L) IN	L6M-29B
L3M-40B	VISC CONT	43	GND	L3M-40A
		44	RST	L3M-7B
	-	45	+12V	L2M-45B
	-	46	+12V	L2M-46B
	-	47	+5V	L2M-47B
	-	48	+5V	L2M-48B
	-	49	GND	L2M-49B
	-	50	GND	L2M-50B

L-1S	TBC - 1			
	B	NO	A	
	GND	1	GND	L2S-1A
		2		
L3M-35B	TBC CF	3	REF CF	L5S-15A
P36-2	VIDEO Ø1	4	VIDEO Ø2	P36-3
P36-4	VIDEO Ø3	5	EXT	L6M-48A
		6	REF SCH	L6S-10A
L6M-22A	TC CF	7	CF SELECT 1	L6S-2A
L6S-3A	CF SELECT 2	8	CF SELECT 3	L6S 4A
L3S-9B	4LP	9	BS OUT	P12-9
	GND	10	HD	P39-10
	-	11	GND	P12-10 L2S-11B
	-	12	GND	L2S-12B
	-	13	+5V	L2S-15B
	-	14	+5V	L2S-16B
P17-1	SCH Ø	15	VIDEO Ø4	P36-5
P17-2	SCH COARSE(1)	16	SCH COARSE(2)	P17-3
	GND	17	COMON (L)	L2M-29A
	GND	18	BLK ON (L)	L2M-34A
		19	E-E (L)	L2M-44A
L2M-43A L6M-35B	SEARCH (L)	20	EJECT TAPE (L)	L6M-34B
	GND	21	ADV CONT (H)	L6M-36A
L2M-27A	Y DOC	22	C DOC	L2M-28A
L2S-22A	PR WZERO	23	PB WZERO	L2S-23A
	GND	24	Y WZERO	L2S-24A
L3S-25B	-	25	GND	L2S-25A
L3S-26B	C DATA 8	26	C DATA 7	L3S-26A
L3S-27B	C DATA 6	27	C DATA 5	L3S-27A
L3S-28B	C DATA 4	28	C DATA 3	L3S-28A
L3S-29B	C DATA 2	29	C DATA 1	L3S-29A
L3S-30B	-	30	GND	L3S-30A
L3S-31B	Y DATA 8	31	Y DATA 7	L3S-31A
L3S-32B	Y DATA 6	32	Y DATA 5	L3S-32A
L3S-33B	Y DATA 4	33	Y DATA 3	L3S-33A
L3S-34B	Y DATA 2	34	Y DATA 1	L3S-34A
L2S-35B	Y WCK	35	Y DATA 9	L3S-35A
L2S-36B	GND	36	C WCK	L2S-36A
POWER1-1	-	37	+5V	L2S-38B
POWER1-2	-	38	+5V	L2S-38B
	-	39	GND	L2S-39B
	-	40	GND	L2S-40B

POWER 1			
L1S-37B POWER2-7	1	+5V	P214-7
L1S-38B POWER2-7	2	+5V	P214-6
	3	GND	P214-5
	4	GND	P214-4
	5	GND	P214-3

To POWER BOX

To FRONT PANEL

P4			
POWER1-1	1	+5V	P126-1
POWER1-1	2	+5V	P126-2
POWER1-1	3	+5V	P126-3
	4	GND	P126-4
	5	GND	P126-5
	6	GND	P126-6

P12			
	1		
	2		
L1M-6B	3	REV VIDEO	P301-9
L1M-6A	4	GND	P301-10
	5		
	6		
L3M43A	7	WFM OUT	P308-2
L3M43B	8	GND	P308-1
L1S-9A	9	BS OUT	P308-4
L1S-11A	10	GND	P308-3

To JACK

To FRONT

P17			
L1S-15B	1	SCH Ø	P114-1
L1S-16B	2	SCH COARSE(1)	P114-2
L1S-16A	3	SCH COARSE(2)	P114-3
L1M-7B	4	SYS SC COARSE (1)	P101-3
L1M-7A	5	SYS SC COARSE (2)	P101-4
L1M-36A	6	CNC ON (L)	P114-5
L1M-31B	7	SYS H Ø	P101-1
L1M-31A	8	SYS SC Ø	P101-12
L2M-33A	9	YC DELAY	P134-5
	10	GND	P134-7

To FRONT

P36			
L3S-3B	1	B/W (L)	P114-4
L1S-4B	2	VIDEO Ø1	P106-8
L1S-4A	3	VIDEO Ø2	P106-9
L1S-5B	4	VIDEO Ø3	P106-10
L1S-15A	5	VIDEO Ø4	P108-10
L3S-6B	6	BURST GAIN	P108-3
L3S-6A	7	SYNC GAIN	P108-2
L3S-7B	8	WFM D	P106-7
L3S-8B	9	WFM E	
L6S-24B	10	PCM ON (L)	

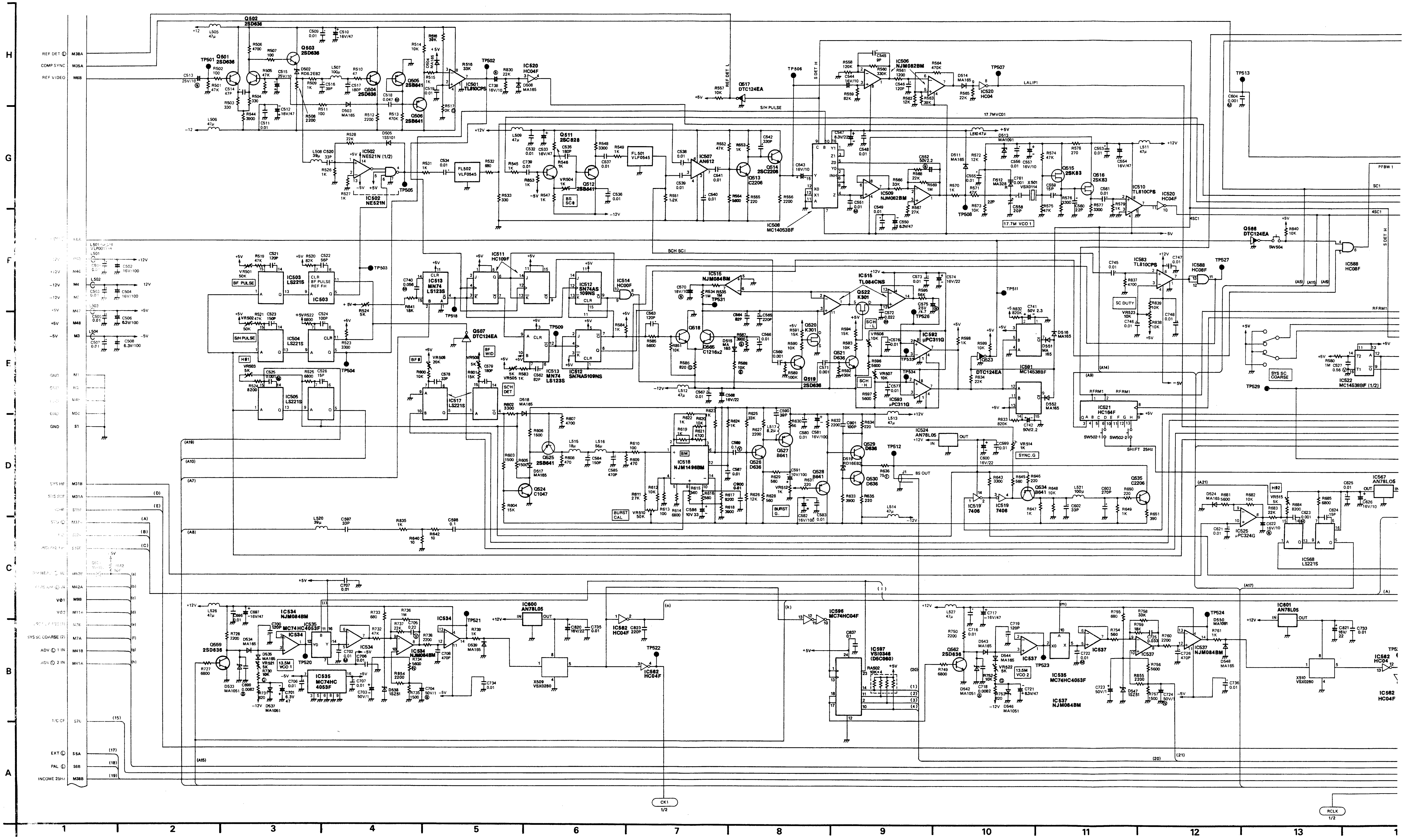
P39			
L5M45B	1	PCM H SW	
L5M46B	2	PCM GATE	
	3	GND	
L6S21A	4	PCM EE1	
L6S22A	5	PCM EE2	
L6S23A	6	STBY (L)	
L6S24A	7	PLAY (L)	
L6M30A	8	R/P HEAD	
L6M29B	9	TAPE R/P	
L1S-10A	10	HD	
	11	GND	
L6S-25B	12	POWER ON (L)	

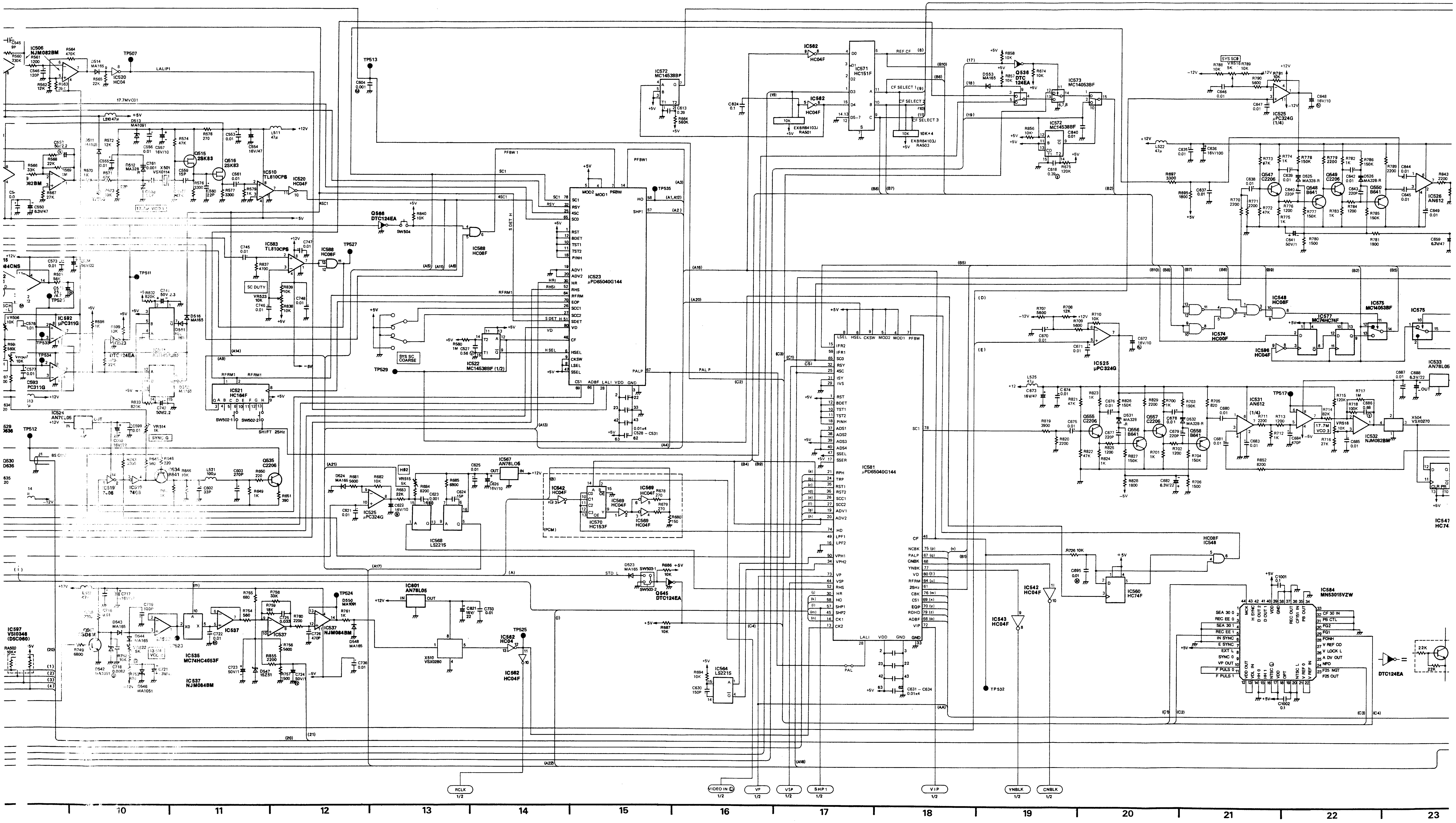
To JACK
(PCM ONLY)

P11			
	1	+5V	P215-1
	2	GND	—
	3	GND	P215-2

To POWER BOX

L1 TBC 1 SYNC GENERATOR SCHEMATIC DIAGRAM (2/2) (SYNC GENERATOR)





IC506 NJM082BM
IC520 HC04
TP507
TP513
IC510 TL810CPS
IC583 TL810CPS
IC588 HC08F
TP527
TP511
Q586 DTC124EA
IC523 µPD65040G144
IC521 HC164F
IC522 MC14538BF (1/2)
TP529
TP535
SYS SC COARSE
SC DUTY
IC592 µPC311G
IC524 AN78L05
TP512
Q535 C2206
IC525 µPC324G
IC568 LS221S
IC567 AN78L05
IC542 HC04F
IC570 HC153F
IC569 HC04F
IC535 MC74HC4053F
IC537 NJM084BM
IC597 VSI0346 (D5C060)
IC601 AN78L05
X510 VSX0280
IC562 HC04
TP524
TP525
IC564 LS221S
Q545 DTC124EA
IC581 µPD65040G144
IC572 MC14538BP
IC571 HC151F
IC573 MC14053BF
Q536 DTC124EA
IC574 HC00F
IC548 HC08F
IC577 MC74HC74F
IC575 MC14053BF
IC596 HC04F
IC531 AN612
IC532 NJM082BM
IC533 AN78L05
IC526 AN612
IC560 HC74F
IC543 HC04F
IC584 MN53015VZW
TP517
TP532
DTC124EA
RCLK 1/2
VIDEO IN 1/2
VP 1/2
VSP 1/2
SHP1 1/2
VIP 1/2
YNBLK 1/2
CNBLK 1/2
10
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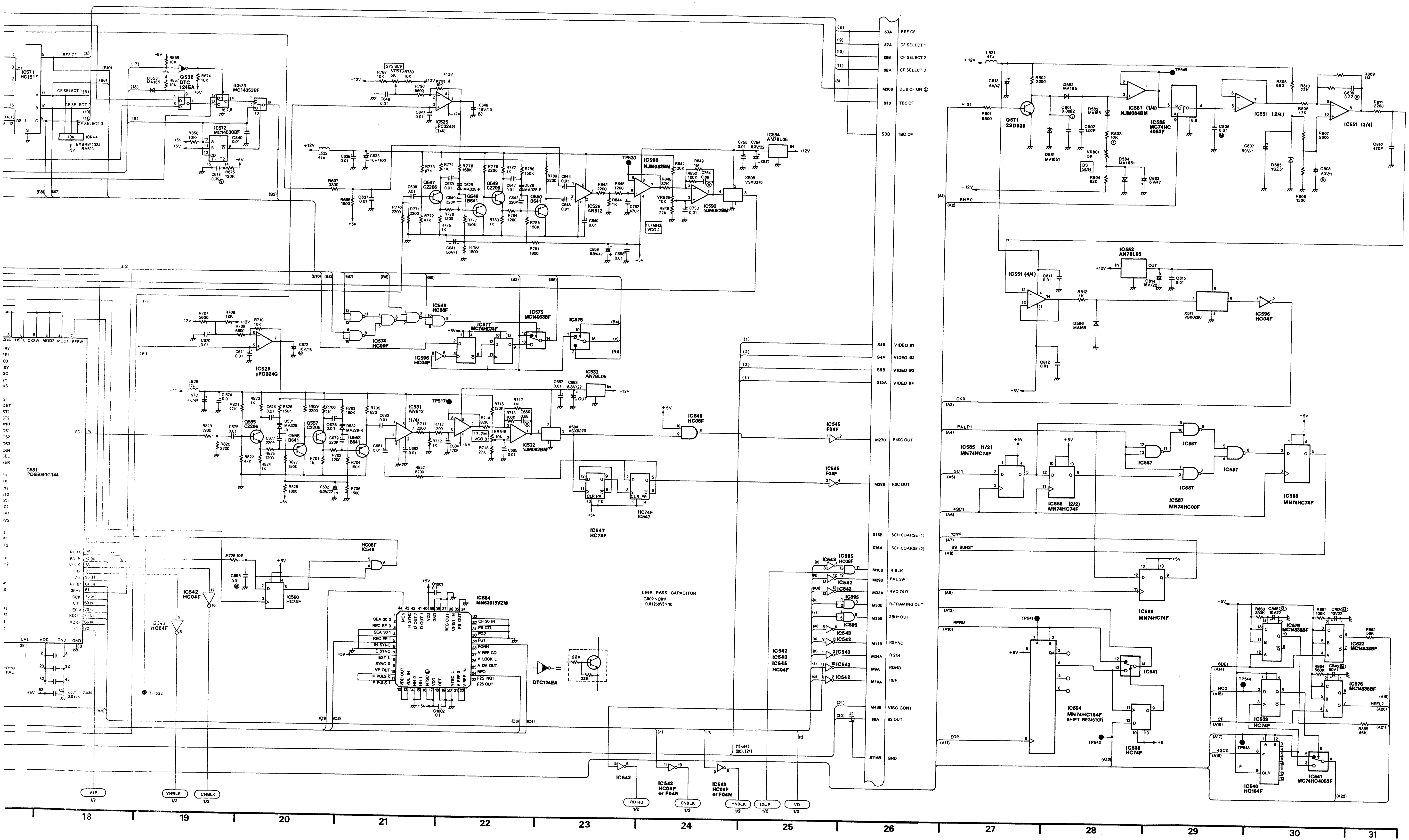
23


IC571 HC151F
IC573 MC14053BF
IC572 MC14538BF
Q536 DTC 124EA
IC525 μPC324G
IC590 NJM082BM
IC594 AN78L05
IC526 AN612
X506 VSX0270
IC548 HC08F
IC574 HC00F
IC577 MC74HC74F
IC575 MC14053BF
IC596 HC04F
IC533 AN78L05
IC531 AN612
IC532 NJM082BM
X504 VSX0270
IC547 HC74F
IC545 F04F
IC581 PD65040G144
IC560 HC74F
IC542 HC04F
IC584 MN53015VZW
DTC124EA
LINE PASS CAPACITOR
C902~C911
0.01(50V)×10
IC595 HC08F
IC543
IC542
IC545 HC04F
REF CF
CF SELECT 1
CF SELECT 2
CF SELECT 3
DUB CF ON
TBC CF
VIDEO #1
VIDEO #2
VIDEO #3
VIDEO #4
R4SC OUT
RSC OUT
SCH COARSE (1)
SCH COARSE (2)
R BLK
PAL SW
RVD OUT
R-FRAMING OUT
25Hz OUT
RSYNC
R 2FH
RDHD
RBF
VISC CONT
BS OUT
GND
IC551 NJM084BM
IC535 MC74HC 4053F
Q571 2SD636
IC552 AN78L05
X511 VSX0280
IC585 MN74HC74F
IC587 MN74HC00F
IC586 MN74HC74F
IC554 MN74HC164F SHIFT REGISTOR
IC541
IC539 HC74F
IC576 MC14538BF
IC522 MC14538BF
IC540 HC164F
IC541 MC74HC4053F
VIP
YNBLK
CNBLK
RD HD
12LP
VD
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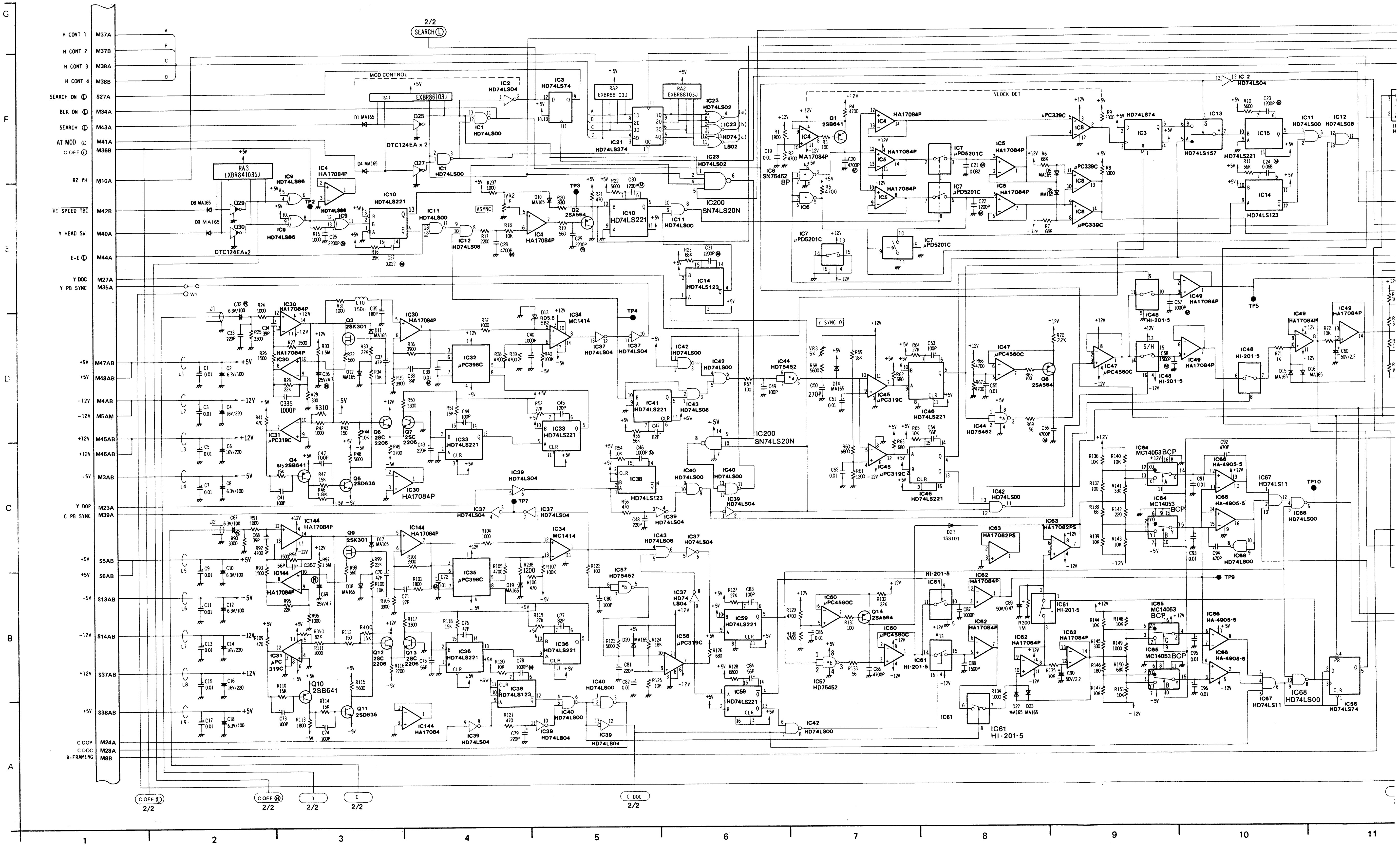
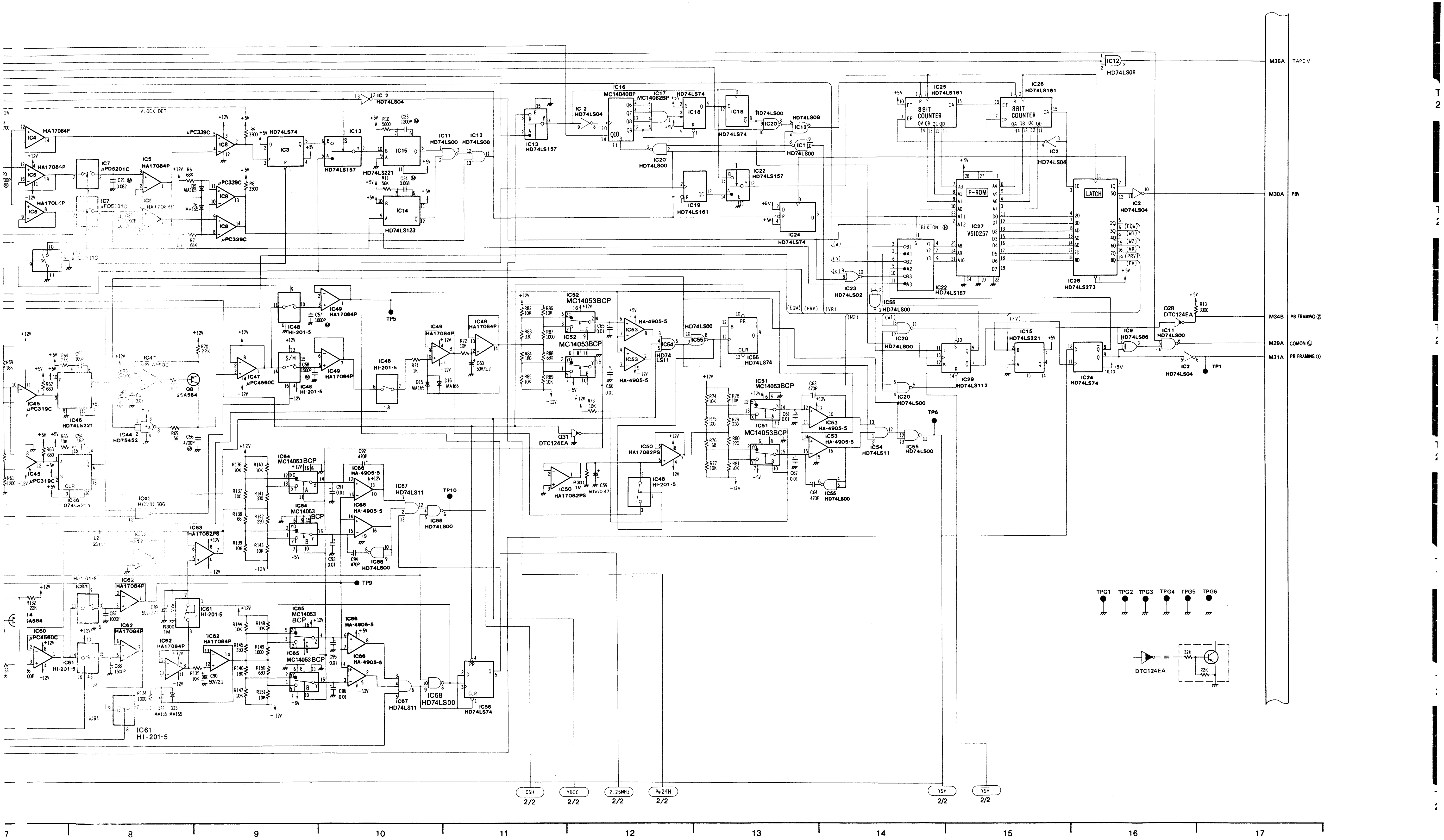
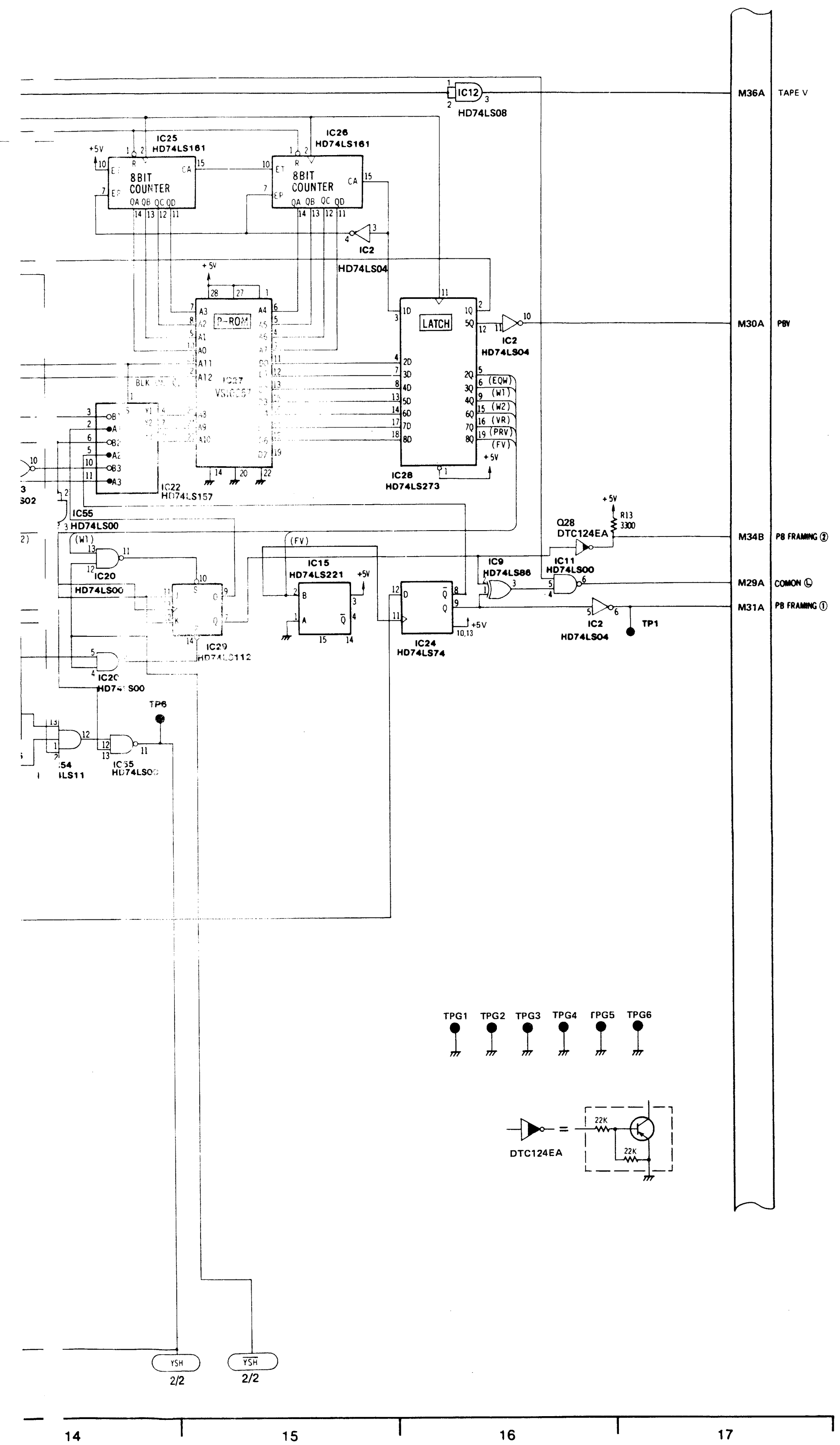
L2 TBC 2 SCHEMATIC DIAGRAM (1/2)

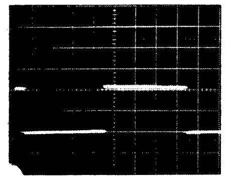




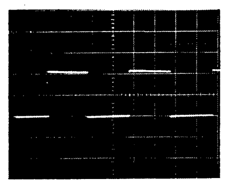
VLOCK DET
M36A TAPE V
M30A PBV
M34B PB FRAMING ②
M29A COMON Ⓒ
M31A PB FRAMING ①
IC25 HD74LS161
IC26 HD74LS161
8BIT COUNTER
P-ROM
IC27 VSI0257
LATCH
IC28 HD74LS273
IC22 HD74LS157
IC23 HD74LS02
IC24 HD74LS74
IC16 MC14040BP
IC17 MC14082BP
IC18 HD74LS74
IC19 HD74LS161
IC13 HD74LS157
IC15 HD74LS221
IC14 HD74LS123
IC3 HD74LS74
IC4 HA17084P
IC5 HA17084P
IC7 μPD5201C
IC8 μPC339C
IC47 μPC4560C
IC48 HI-201-5
IC49 HA17084P
IC52 MC14053BCP
IC53 HA-4905-5
IC54 HD74LS11
IC55 HD74LS00
IC56 HD74LS74
IC50 HA17082PS
IC51 MC14053BCP
IC29 HD74LS112
IC64 MC14053BCP
IC65 MC14053BCP
IC66 HA-4905-5
IC67 HD74LS11
IC68 HD74LS00
IC61 HI-201-5
IC62 HA17084P
IC63 HA17082PS
IC60 μPC4560C
IC45 μPC319C
IC46 HD74LS221
IC44 HD75452
Q8 2SA564
Q28 DTC124EA
Q31 DTC124EA
BLK ON
S/H
TP1
TP5
TP6
TP9
TP10
TPG1 TPG2 TPG3 TPG4 TPG5 TPG6
DTC124EA
CSH 2/2
YDGC 2/2
2.25MHz 2/2
Pe2fH 2/2
YSH 2/2
YSH 2/2
7 8 9 10 11 12 13 14 15 16 17



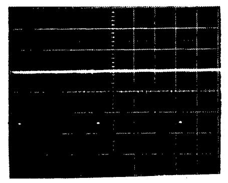
L2 TBC2 WAVEFORMS



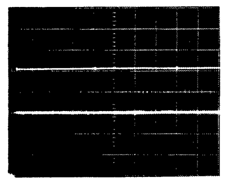
TP1
2V/5msec. div.



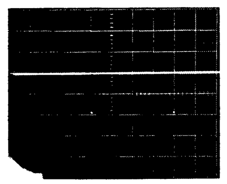
TP2
2V/10msec. div.



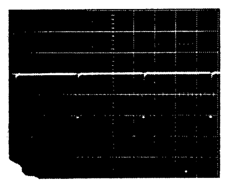
TP3
2V/5msec. div.



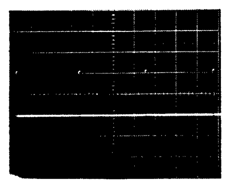
TP4
2V/5msec. div.



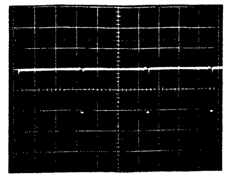
TP5
1V/5msec. div.



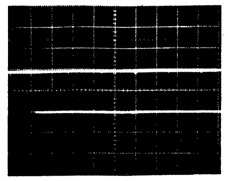
TP6
2V/20μsec. div.



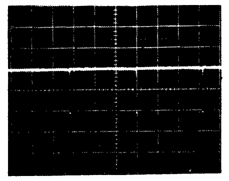
TP7
2V/20μsec. div.



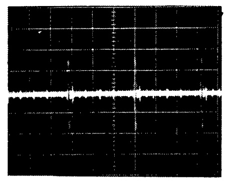
TP10
2V/20μsec. div.



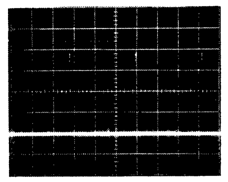
TP13
2V/20μsec. div.



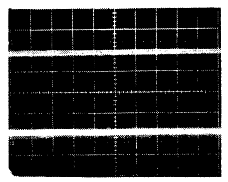
TP16
2V/20μsec. div.



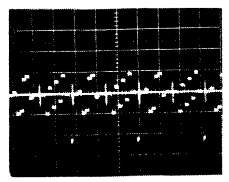
TP18
500mV/20μsec. div.



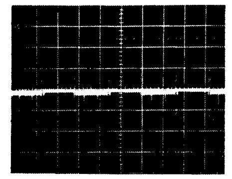
TP19
1V/20μsec. div.



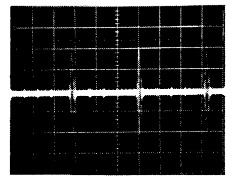
TP20
1V/10μsec. div.



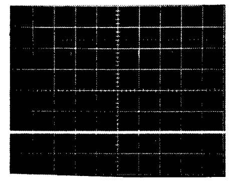
TP21
500mV/20μsec. div.



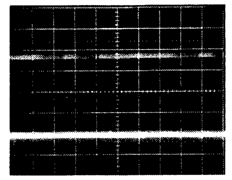
TP22
500mV/20μsec. div.



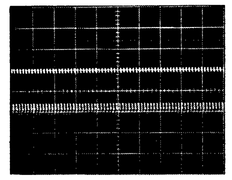
TP23
200mV/10μsec. div.



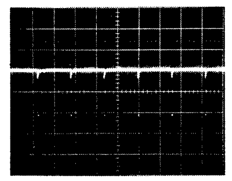
TP24
1V/20μsec. div.



TP25
1V/10μsec. div.



TP31
2V/0.5μsec. div.



TP32
2V/20μsec. div.

L-2M		TBC − 2				
B			NO	A		
L1M-1A		−	1	GND	L3M-1B	
L1M-2A			2	GND	L3M-2B	
L1M-3A		−	3	5V	L3M-3B	
L1M-4A			4	12V	L3M-4B	
L1M-5A		−	5	12V	L3M-5B	
			6			
			7			
L1M-33B	L6M29A	R FRAMING	8	GND	L1M-33A	
		GND	9			
		GND	10	R2fH	L1M-34A	
		GND	11			
		GND	12			
		GND	13			
		GND	14			
		GND	15			
		GND	16			
		GND	17			
		GND	18			
		GND	19			
		GND	20			
		GND	21	COUNT (H)	L1M-21A	
		GND	22			
P26−2		GND	23	Y DOP	P26−1	L6M32B
P26−4		GND	24	C DOP	P26−3	L6M-32A
			25			
			26			
		GND	27	Y DOC	L1S-22B	
		GND	28	C DOC	L1S-22A	
		GND	29	COMON (L)	L1S-17A	
		GND	30	PBV	L1M-34B	
L5M-31B		GND	31	PB FRAMING (1)	L5M-31A	
		GND	32	$\overline{\text{N·STD}}$	L6M-36B	
P26-8		GND	33	YC DELAY	P17−9	
P26-7		PB FRAMING (2)	34	BLK ON (L)	L1S-18A	
P26−10	L5M-29B	GND	35	Y PB SYNC	P26−9	L5M-29A
L3M-36B		C OFF (L)	36	TAPE V	L6M-18B	
P34-2		H CONT 2	37	H CONT 1	P34-1	
P34-4		H CONT 4	38	H CONT 3	P34-3	
P26−12		GND	39	C PB SYNC	P26−11	
L5M-14B		GND	40	Y HEAD SW	L5M-12B	
		GND	41	AT MODE (L)	L6M-33A	
L6M-34A		$\overline{\text{HI SPEED TBC}}$	42			
		GND	43	SEARCH (L)	L1S-20B	
		GND	44	EE (L)	L1S-19A	L3S-9A
L1M-45A		−	45	+12V	L3M-45B	
L1M-46A		−	46	+12V	L3M-46B	
L1M-47A		−	47	+5V	L3M-47B	
L1M-48A		−	48	+5V	L3M-48B	
L1M-49A		−	49	GND	L3M-49B	
L1M-50A		−	50	GND	L3M-50B	

L-2S		TBC − 2				
B			NO	A		
L1S-1A		GND	1	GND	L3S-1B	
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
L1S-11A		−	11	GND	L3S-11B	
L1S-12A		−	12	GND	L3S-12B	
		−	13	−5V	L3S-13B	
		−	14	−12V	L3S-14B	
L1S-13A		−	15	+5V	L3S-38B	
L1S-14A		−	16	+5V	L3S-38B	
L3S-1A		GND	17	C PB	L3S-2A	
L3S-1A		GND	18	Y PB	L3S-3A	
			19			
			20			
		GND	21			
		GND	22	PR WZERO	L1S-23B	
		GND	23	PB WZERO	L1S-23A	
		GND	24	Y WZERO	L1S-24A	
L3S-23B	P26-5	AGC CP	25	GND	L1S-25A	
L3S-24B	P26-6	C CP	26	Y CP	L3S-24A	
		GND	27	SEARCH ON (L)	L3S-23A	
		GND	28			
		GND	29			
		GND	30			
			31			
			32			
			33			
			34			
L1S-35B	L3S-35B	YWCK	35	GND		
L1S-36B	L3S-36B	GND	36	C WCK	L1S-36A	L3S-36A
		−	37	+12V	L3S-37B	
L1S-37A, 38A		−	38	+5V	L3S-38B	
L1S-39A		−	39	GND	L3S-39B	
L1S-40A		−	40	GND	L3S-40B	

To FRONT

P17			
L1S-15B	1	SCH Ø	P114 · 1
L1S-16B	2	SCH COARSE(1)	P114 · 2
L1S-16A	3	SCH COARSE(2)	P114 · 3
L1M-7B	4	SYS·SC·COARSE (1)	P101 · 3
L1M-7A	5	SYS·SC·COARSE (2)	P101 · 4
L1M-36A	6	CNC ON (L)	P114 · 5
L1M-31B	7	SYS H Ø	P101 · 1
L1M-31A	8	SYS SC Ø	P101 · 12
L2M-33A	9	YC DELAY	P134 · 5
	10	GND	P134 · 7

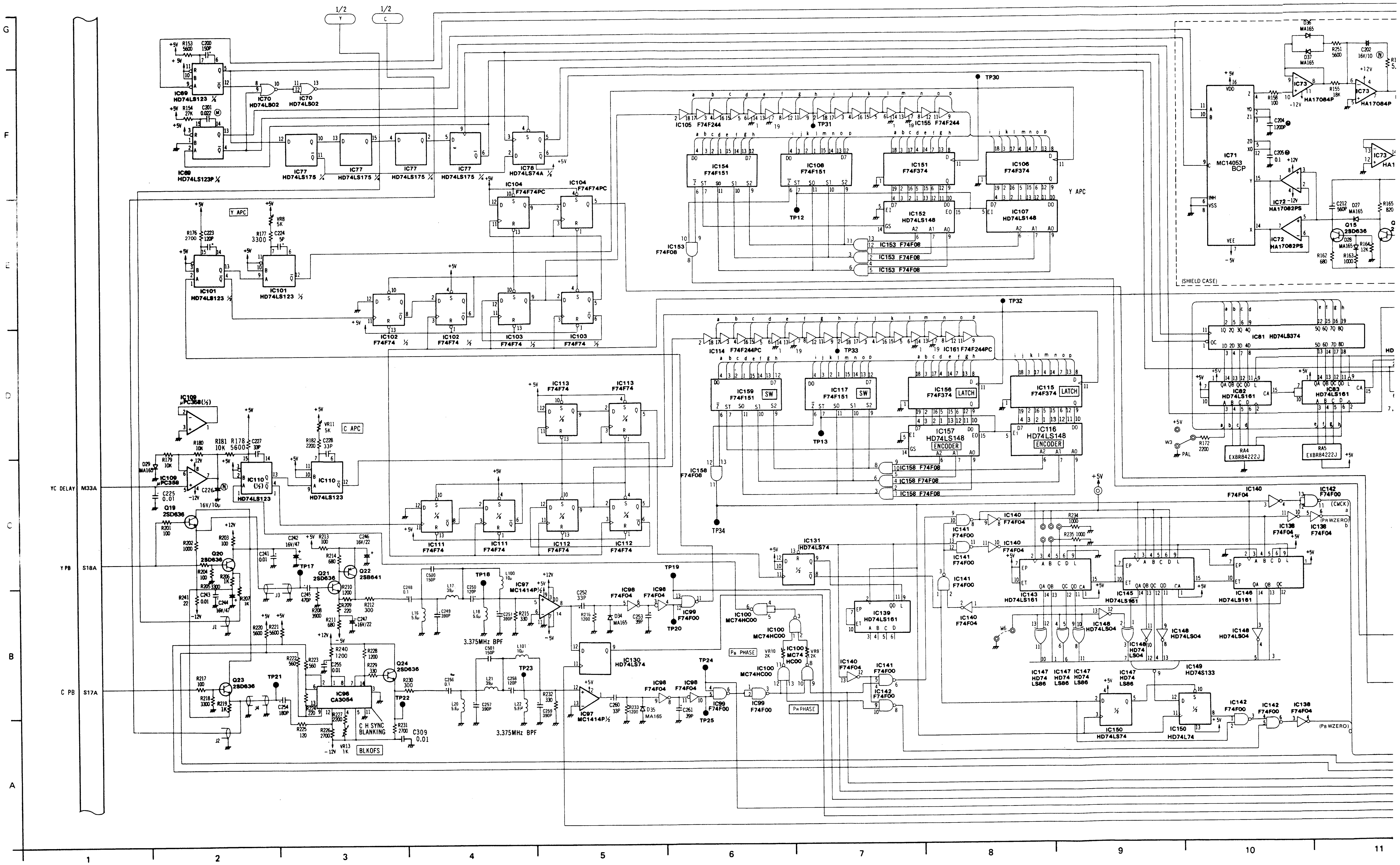
To SØ

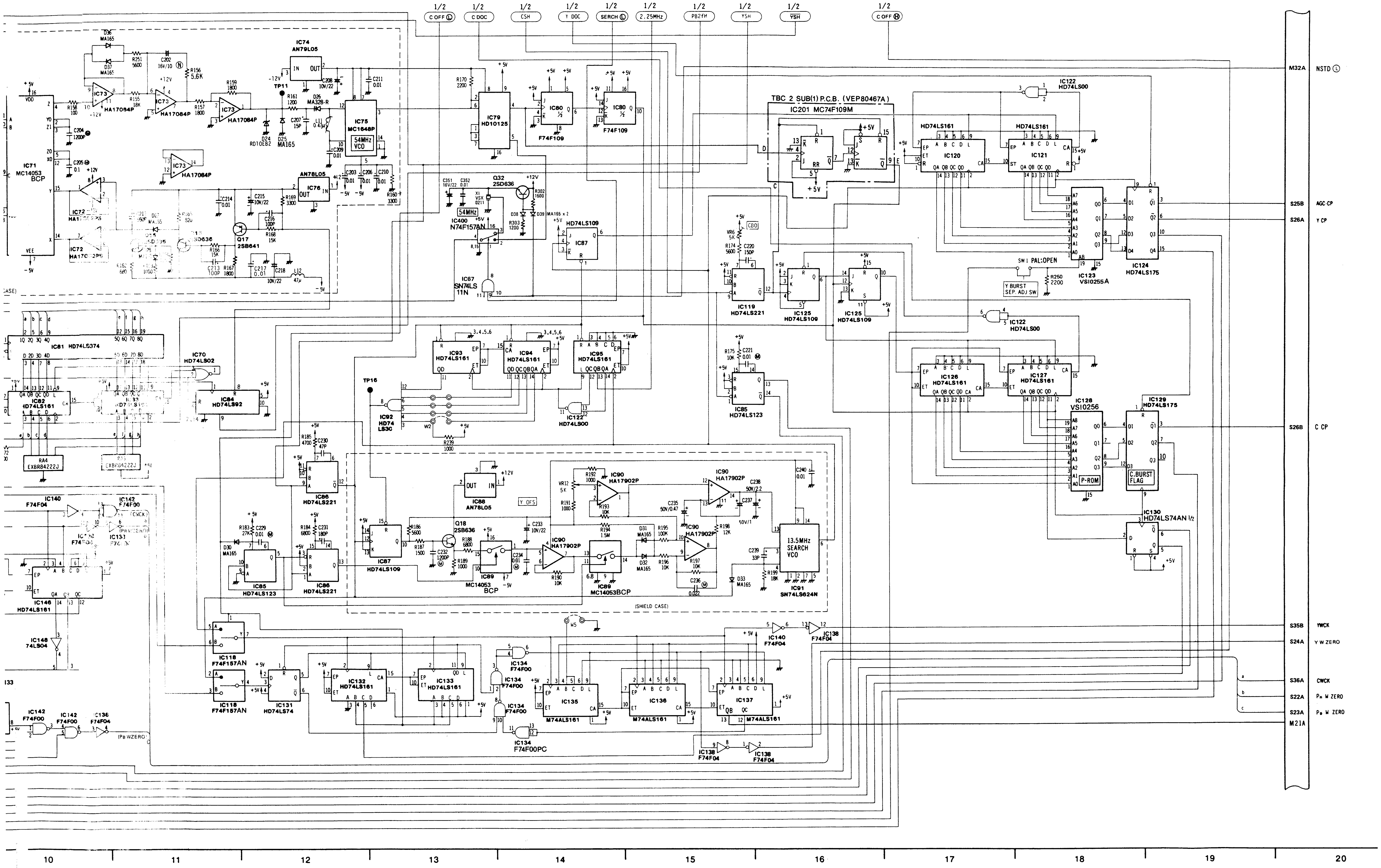
P26			
L2M23A	1	Y DOP	P57 · 3
L2M23B	2	GND	P57 · 4
L2M24A	3	C DOP	P57 · 1
L2M24B	4	GND	P57 · 2
L2S25B	5	Y AGC CP	P78-8
L2S26B	6	C CP	P78-9
L2M34B	7	PB FRAMING(2)	P64 · 8
L2M33B	8	GND	
L2M35A	9	Y PB SYNC	P64 · 10
L2M35B	10	GND	P64 · 9
L2M39A	11	C PB SYNC	P64 · 12
L2M39B	12	GND	P64 · 11

To S0

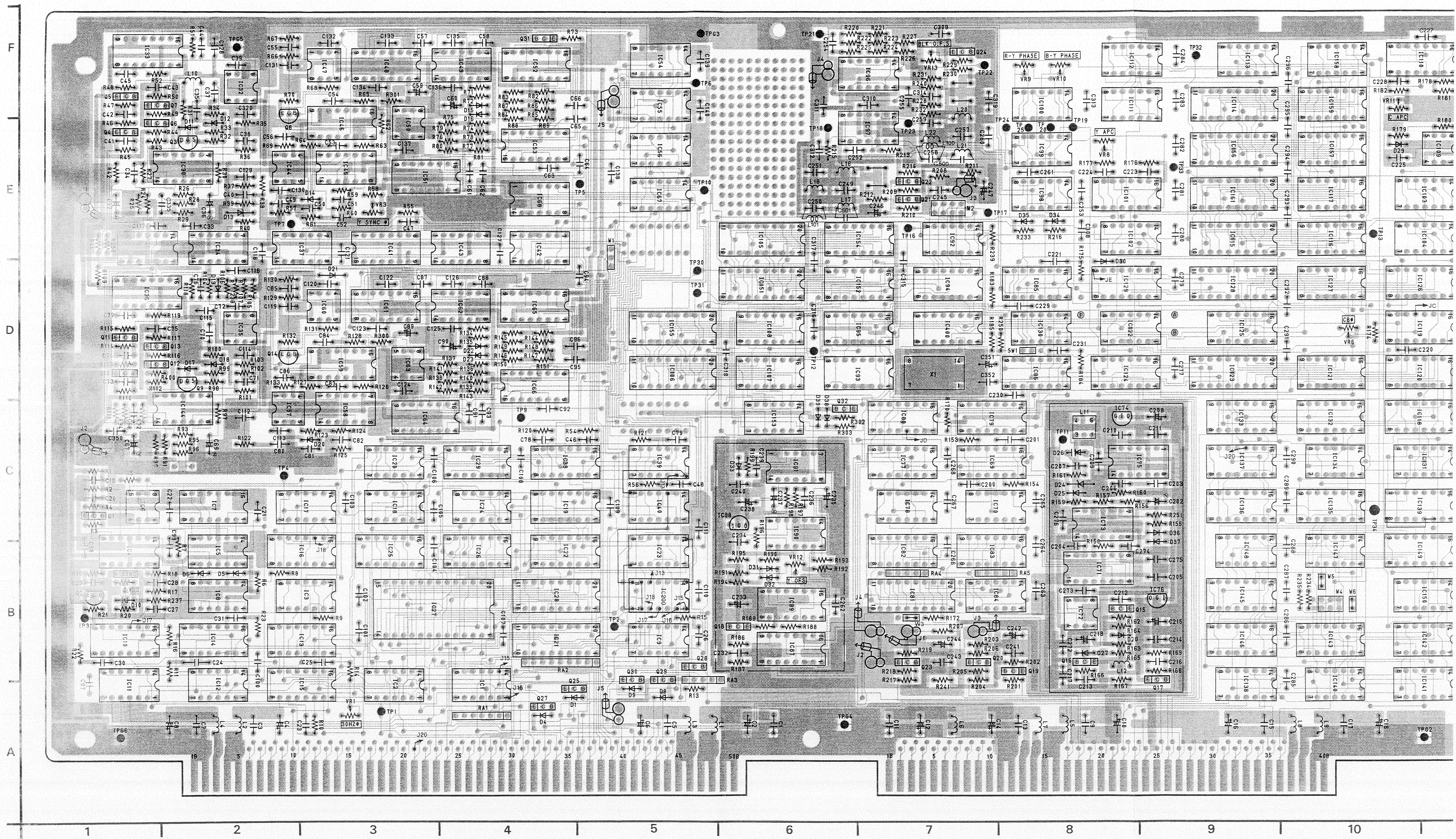
P34			
L2M37A	1	H CONT 1	P77 · 1
L2M37B	2	H CONT 2	P77 · 2
L2M38A	3	H CONT 3	P77 · 3
L2M38B	4	H CONT 4	P77 · 4

L2 TBC 2 SCHEMATIC DIAGRAM (2/2)



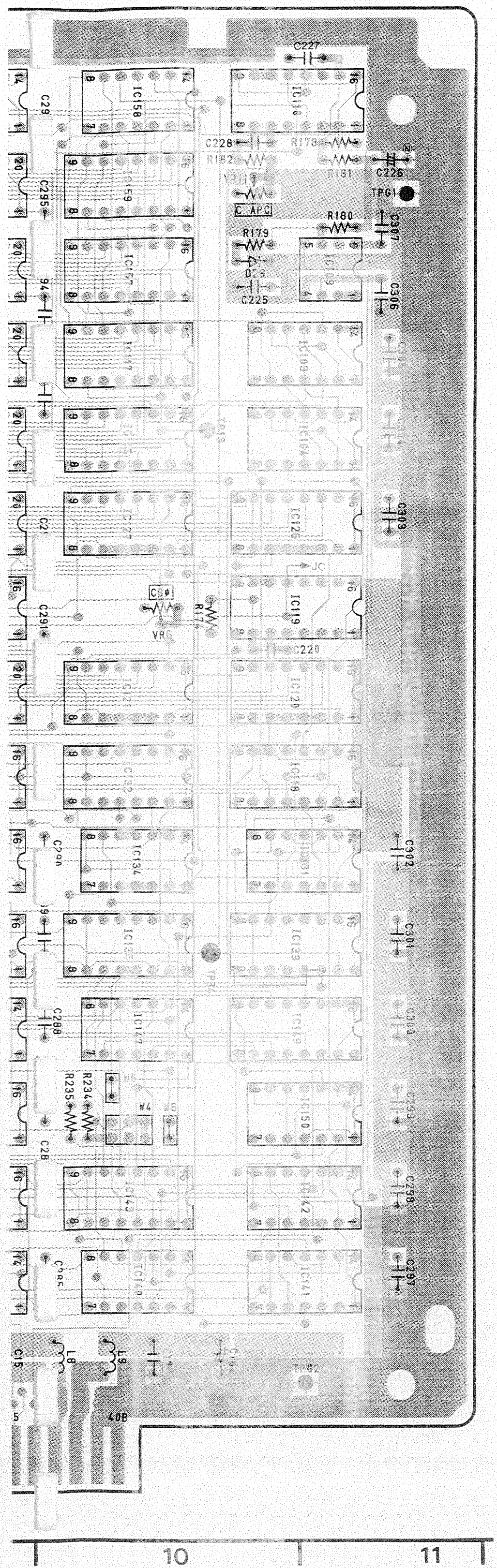

1/2
C OFF Ⓛ
C DOC
CSH
Y DOC
SERCH Ⓛ
2.25MHz
PB2fH
YSH
C OFF Ⓗ
TBC 2 SUB(1) P.C.B. (VEP80467A)
IC201 MC74F109M
IC71 MC14053 BCP
IC73 HA17084P
IC74 AN79L05
IC75 MC1648P
54MHz VCO
IC76 AN78L05
IC79 HD10125
IC80 F74F109
Q32 2SD636
Q17 2SB641
IC400 N74F157AN
IC67 SN74LS11N
IC87 HD74LS109
IC119 HD74LS221
IC125 HD74LS109
IC120 HD74LS161
IC121 HD74LS161
IC122 HD74LS00
IC123 VS10255A
IC124 HD74LS175
SW1 PAL:OPEN
Y BURST SEP. ADJ SW
IC81 HD74LS374
IC70 HD74LS02
IC82 HD74LS161
IC84 HD74LS92
RA4 EXBR84222J
IC93 HD74LS161
IC94 HD74LS161
IC95 HD74LS161
IC92 HD74LS30
TP16
IC85 HD74LS123
IC126 HD74LS161
IC127 HD74LS161
IC128 VS10256
P-ROM
IC129 HD74LS175
C.BURST FLAG
IC130 HD74LS74AN 1/2
IC86 HD74LS221
IC88 AN78L05
Y OFS
Q18 2SB636
IC89 MC14053BCP
IC90 HA17902P
13.5MHz SEARCH VCO
IC91 SN74LS624N
(SHIELD CASE)
IC140 F74F04
IC142 F74F00
IC146 HD74LS161
IC148 74LS04
IC118 F74F157AN
IC131 HD74LS74
IC132 HD74LS161
IC133 HD74LS161
IC134 F74F00
IC135 M74ALS161
IC136 M74ALS161
IC137 M74ALS161
IC138 F74F04
IC134 F74F00PC
M32A NSTD Ⓛ
S25B AGC CP
S26A Y CP
S26B C CP
S35B YWCK
S24A Y W ZERO
S36A CWCK
S22A Pᴍ W ZERO
S23A Pᴍ W ZERO
M21A
10
11
12
13
14
15
16
17
18
19
20

L2 TBC 2 P.C. BOARD (VEP88020B)

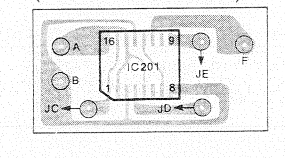


REVERSE SIDE

L2 TBC 2 SCHEMATIC DIAGRAM (2/2)



TBC 2 SUB (1) P.C.B.
(VEP80467A)
(PART OF VEP88020B)



TBC-2 (L2)

Transistors

Q1	C-1
Q2	B-1
Q3	E-2
Q4	E-1
Q5	F-1
Q6	E-1
Q7	F-1
Q8	E-2
Q9	D-2
Q10	D-1
Q11	D-1
Q12	D-1
Q13	D-1
Q14	D-2
Q15	B-8
Q16	B-8
Q17	A-9
Q18	B-6
Q19	B-8
Q20	B-7
Q21	E-7
Q22	E-7
Q23	B-7
Q24	F-7
Q25	A-5
Q27	A-4
Q28	B-5
Q29	B-5
Q30	B-5
Q31	F-4
Q32	C-6

Integrated Circuits

IC1	A-4
IC2	A-3
IC3	B-3
IC4	B-1
IC5	B-2
IC6	C-1
IC7	C-2
IC8	B-2
IC9	B-5
IC10	B-1
IC11	A-1
IC12	A-2
IC13	B-3
IC14	B-2
IC15	A-3
IC16	B-3
IC17	C-3
IC18	C-3
IC19	C-4
IC20	C-3
IC21	B-4
IC22	B-4
IC23	B-5
IC24	C-4
IC25	B-3
IC26	B-4
IC27	B-3
IC28	B-4
IC29	C-4
IC30	E-2
IC31	E-1
IC32	F-2
IC33	F-1
IC34	E-2
IC35	D-2
IC36	D-1
IC37	E-3
IC38	C-4
IC39	C-5
IC40	C-5
IC41	E-3
IC42	E-4
IC43	E-4
IC44	E-2
IC45	E-3
IC46	E-3
IC47	F-3
IC48	F-3
IC49	F-4
IC50	E-3
IC51	E-3
IC52	F-4
IC53	E-4
IC54	F-5
IC55	F-5
IC56	E-5
IC57	C-2
IC58	C-3
IC59	D-3
IC60	D-3
IC61	D-3
IC62	D-4
IC63	D-3
IC64	C-3
IC65	D-4
IC66	D-4
IC67	E-5
IC68	E-4
IC69	C-7
IC70	C-7
IC71	B-8
IC72	B-8
IC73	C-8
IC74	C-8
IC75	C-8
IC76	B-9
IC77	C-7
IC78	C-7
IC79	C-7
IC80	C-7
IC81	B-7
IC82	B-7
IC83	B-7
IC84	B-7
IC85	D-8
IC86	D-8
IC87	B-6
IC88	C-6
IC89	B-6
IC90	C-6
IC91	C-6
IC92	E-7
IC93	D-7
IC94	D-7
IC95	D-7
IC96	F-7
IC97	E-7
IC98	E-8
IC99	E-8
IC100	F-8
IC101	E-8
IC102	E-8
IC103	E-11
IC104	E-11
IC105	E-6
IC106	D-5
IC107	D-6
IC108	D-6
IC109	E-11
IC110	F-10
IC111	F-8
IC112	F-8
IC113	F-9
IC114	F-9
IC115	E-9
IC116	E-10
IC117	E-10
IC118	C-11
IC119	D-11
IC120	D-11
IC121	D-10
IC122	D-8
IC123	D-9
IC124	D-8
IC125	D-9
IC126	D-11
IC127	D-10
IC128	D-9
IC129	D-8
IC130	D-8
IC131	C-11
IC132	C-10
IC133	C-9
IC134	C-10
IC135	C-10
IC136	C-9
IC137	C-9
IC138	A-9
IC139	C-11
IC140	A-10
IC141	A-11
IC142	B-11
IC143	B-10
IC144	C-2
IC145	B-9
IC146	B-9
IC147	B-10
IC148	B-9
IC149	B-11
IC150	B-11
IC151	D-6
IC152	D-7
IC153	C-6
IC154	E-7
IC155	D-5
IC156	E-9
IC157	E-10
IC158	F-10
IC159	F-10
IC161	E-9
IC200	B-5
IC400	D-7

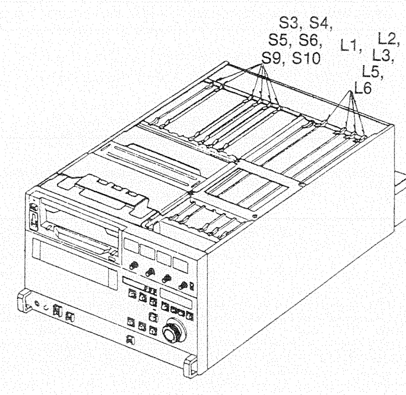
Test Points

TP1	A-3
TP2	B-5
TP3	B-1
TP4	C-2
TP5	E-5
TP6	F-5
TP7	E-2
TP9	C-4
TP10	E-5
TP11	C-8
TP12	D-6
TP13	E-10
TP16	E-7
TP17	E-7
TP18	E-6
TP19	E-8
TP20	E-8
TP21	F-6
TP22	F-7
TP23	E-7
TP24	E-8
TP25	E-8
TP30	D-5
TP31	D-5
TP32	F-9
TP33	E-9
TP34	C-10
TPG1	F-11
TPG2	A-11
TPG3	F-5
TPG4	A-6
TPG5	F-2
TPG6	A-1

Adjustments

VR1	A-3
VR2	B-1
VR3	E-3
VR6	D-10
VR8	E-8
VR9	F-8
VR10	F-8
VR11	F-10
VR12	B-6
VR13	F-7

ADDRESS INFORMATION



VISC SUB (L3)

Transistors

Q400	A-4
Q401	A-4
Q402	B-4
Q403	A-4
Q404	A-4
Q405	A-3
Q406	A-4
Q407	A-2
Q408	A-2
Q409	B-5
Q411	B-4
Q412	B-3
Q413	B-3
Q414	B-4
Q415	B-4
Q416	B-2

Integrated Circuits

IC400	A-4
IC401	A-4
IC415	B-5
IC419	B-5
IC423	A-5
IC424	A-2
IC425	A-2
IC441	A-5
IC442	A-5

Test Points

TP402	B-3
TPG401	B-1

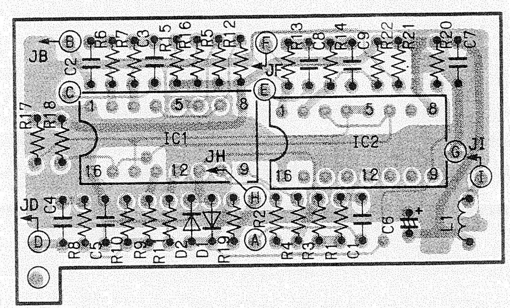
Adjustments

VR400	A-3
VR401	A-3
VR406	B-3
VR407	B-3

ADDRESS INFORMATION

L3 ENCODER SUB P.C.B.

ENCODER SUB P.C.B. (VEP80211A)
(PART OF VEP88040A)



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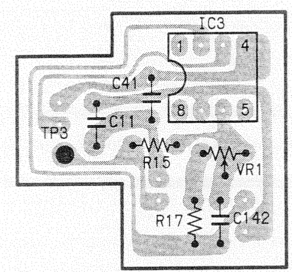
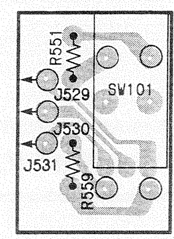


REF. NO. 7000 SERIES

LPF SELECT SW (VEP80424A)
(PART OF VEP88040A)



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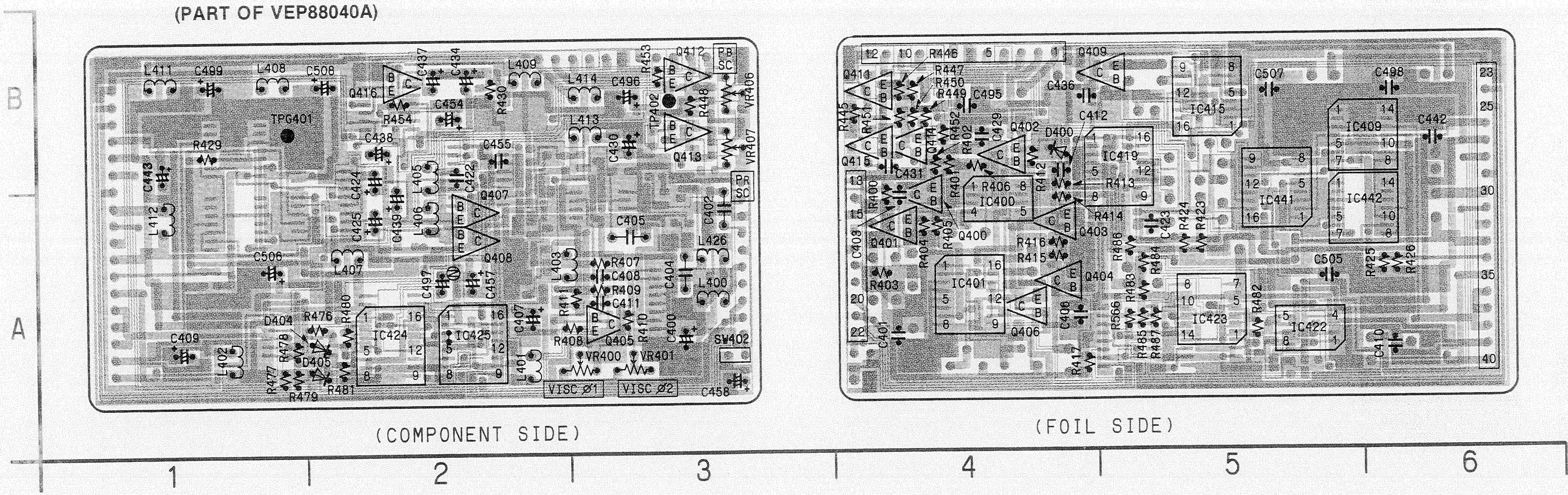
(PART OF VEP88040A)



ENCODER (L3)

Transistors	
Q1	F-9
Q2	F-9
Q3	E-11
Q4	E-10
Q5	E-11
Q6	E-11
Q7	E-11
Q8	D-11
Q9	D-10
Q10	D-10
Q11	C-10
Q12	C-10
Q13	E-9
Q14	E-9
Q15	E-10
Q16	E-9
Q17	D-10
Q18	C-10
Q19	C-9
Q20	F-9
Q21	F-9
Q23	E-9
Q200	B-2
Q200	B-2
Q201	C-1
Q202	C-1
Q203	D-1
Q204	C-2
Q205	D-1
Q208	D-1
Q209	E-1
Q210	E-1
Q211	E-1
Q212	E-1
Q213	D-2
Q214	E-2
Q215	E-2
Q216	E-2
Q217	E-2
Q219	C-3
Q220	C-4
Q221	C-3
Q222	C-4
Q223	D-3
Q224	B-2
Q225	C-2
Q226	C-2
Q227	C-2
Q228	E-3
Q229	E-3
Q230	E-3
Q231	E-3
Q232	D-4
Q233	D-4
Q235	C-3
Q236	C-3
Q237	C-3
Q238	C-3
Q239	D-3
Q240	B-2
Q241	C-2
Q242	C-2
Q243	C-2
Q244	E-4
Q245	E-4
Q246	A-5
Q247	C-5
Q248	C-5
Q249	C-5
Q250	C-5
Q251	D-5
Q252	C-5
Q253	C-5
Q254	D-4
Q255	D-4
Q256	C-5
Q257	C-5
Q420	D-6
Q421	D-5

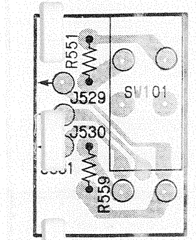
Q422	D-6
Q423	E-6
Q424	D-6
Q425	E-6
Q426	E-6
Q427	E-5
Q428	E-6
Q429	E-6
Q430	E-6
Q431	E-6
Q432	C-8
Q433	F-8
Q434	F-8
Q435	F-7
Q436	F-8
Q437	F-8
Q438	F-7
Q439	F-8
Q440	F-7
Q441	F-7
Q442	F-8
Q443	C-8
Q600	F-3
Q601	F-2
Q602	E-5
Q603	E-5
Q604	E-5
Q605	E-6
Q606	E-6
Q607	E-6
Q608	C-8
Q609	E-8
Q610	D-8
Q611	E-8
Q612	E-8
Q613	D-8
Q614	D-9
Q615	E-8
Q616	E-8
Q617	E-8
Q618	E-8
Q619	F-5
Q620	F-6
Q621	F-5
Q622	F-6
Q623	F-6
Q624	F-6
Q625	F-6
Q626	F-7
Q627	E-7
Q628	E-8
Q629	E-7
Q630	E-7
Q631	E-8
Q632	E-7
Q633	E-7
Q634	E-7
Q635	E-7
Q638	C-7
Q641	D-8
Q642	D-8
Q643	D-8
Q644	D-8
Q645	D-8
Q646	D-9

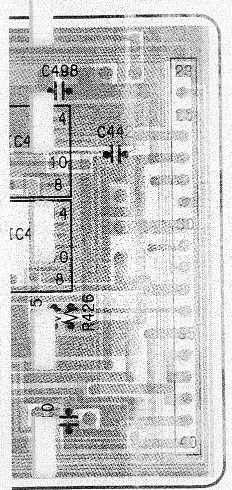
Integrated Circuits	
IC1	B-11
IC2	E-10
IC3	E-10
IC4	B-11
IC5	C-11
IC6	B-10
IC7	B-10
IC10	E-11
IC11	D-11
IC12	D-10
IC13	C-10
IC14	C-10
IC15	E-10
IC16	B-9

IC17
IC19
IC20
IC21
IC22
IC23
IC24
IC25
IC200
IC201
IC202
IC203
IC204
IC205
IC206
IC207
IC208
IC209
IC210
IC211
IC212
IC213
IC214
IC215
IC216
IC217
IC218
IC219
IC220
IC221
IC222
IC223
IC225
IC226
IC227
IC228
IC229
IC230
IC231
IC232
IC402
IC404
IC405
IC406
IC407
IC408
IC410
IC411
IC412
IC413
IC414
IC416
IC417
IC418
IC420
IC421
IC426
IC427
IC429
IC430
IC431
IC432
IC433
IC434
IC435
IC436
IC437
IC439
IC450
IC600
IC601
IC602
IC603
IC604
IC606
IC607
IC608
IC609
IC610
IC611
IC612

ADDRESS INFORMATION

LECT SW (VEP80424A)
)F VEP88040A)





6

ENCODER (L3)

Transistors

Q1	F-9
Q2	F-9
Q3	E-11
Q4	E-10
Q5	E-11
Q6	E-11
Q7	E-11
Q8	D-11
Q9	D-10
Q10	D-10
Q11	C-10
Q12	C-10
Q13	E-9
Q14	E-9
Q15	E-10
Q16	E-9
Q17	D-10
Q18	C-10
Q19	C-9
Q20	F-9
Q21	F-9
Q23	E-9
Q200	B-2
Q200	B-2
Q201	C-1
Q202	C-1
Q203	D-1
Q204	C-2
Q205	D-1
Q208	D-1
Q209	E-1
Q210	E-1
Q211	E-1
Q212	E-1
Q213	D-2
Q214	E-2
Q215	E-2
Q216	E-2
Q217	E-2
Q219	C-3
Q220	C-4
Q221	C-3
Q222	C-4
Q223	D-3
Q224	B-2
Q225	C-2
Q226	C-2
Q227	C-2
Q228	E-3
Q229	E-3
Q230	E-3
Q231	E-3
Q232	D-4
Q233	D-4
Q235	C-3
Q236	C-3
Q237	C-3
Q238	C-3
Q239	D-3
Q240	B-2
Q241	C-2
Q242	C-2
Q243	C-2
Q244	E-4
Q245	E-4
Q246	A-5
Q247	C-5
Q248	C-5
Q249	C-5
Q250	C-5
Q251	D-5
Q252	C-5
Q253	C-5
Q254	D-4
Q255	D-4
Q256	C-5
Q257	C-5
Q420	D-6
Q421	D-5
Q422	D-6
Q423	E-6
Q424	D-6
Q425	E-6
Q426	E-6
Q427	E-5
Q428	E-6
Q429	E-6
Q430	E-6
Q431	E-6
Q432	C-8
Q433	F-8
Q434	F-8
Q435	F-7
Q436	F-8
Q437	F-8
Q438	F-7
Q439	F-8
Q440	F-7
Q441	F-7
Q442	F-8
Q443	C-8
Q600	F-3
Q601	F-2
Q602	E-5
Q603	E-5
Q604	E-5
Q605	E-6
Q606	E-6
Q607	E-6
Q608	C-8
Q609	E-8
Q610	D-8
Q611	E-8
Q612	E-8
Q613	D-8
Q614	D-9
Q615	E-8
Q616	E-8
Q617	E-8
Q618	E-8
Q619	F-5
Q620	F-6
Q621	F-5
Q622	F-6
Q623	F-6
Q624	F-6
Q625	F-6
Q626	F-7
Q627	E-7
Q628	E-8
Q629	E-7
Q630	E-7
Q631	E-8
Q632	E-7
Q633	E-7
Q634	E-7
Q635	E-7
Q638	C-7
Q641	D-8
Q642	D-8
Q643	D-8
Q644	D-8
Q645	D-8
Q646	D-9

Integrated Circuits

IC1	B-11
IC2	E-10
IC3	E-10
IC4	B-11
IC5	C-11
IC6	B-10
IC7	B-10
IC10	E-11
IC11	D-11
IC12	D-10
IC13	C-10
IC14	C-10
IC15	E-10
IC16	B-9
IC17	A-9
IC19	D-9
IC20	C-10
IC21	C-11
IC22	B-11
IC23	B-9
IC24	C-10
IC25	B-11
IC200	B-2
IC201	B-2
IC202	D-2
IC203	C-1
IC204	D-2
IC205	D-1
IC206	D-2
IC207	E-2
IC208	C-4
IC209	A-1
IC210	B-1
IC211	B-4
IC212	B-4
IC213	C-4
IC214	C-3
IC215	C-4
IC216	B-2
IC217	B-2
IC218	D-3
IC219	C-2
IC220	C-4
IC221	D-3
IC222	D-3
IC223	E-3
IC225	B-3
IC226	B-3
IC227	C-3
IC228	B-5
IC229	B-5
IC230	B-5
IC231	B-4
IC232	E-2
IC402	C-7
IC404	C-7
IC405	B-7
IC406	D-6
IC407	C-6
IC408	C-6
IC410	B-7
IC411	B-7
IC412	B-7
IC413	B-7
IC414	B-6
IC416	B-8
IC417	B-8
IC418	B-8
IC420	B-6
IC421	B-7
IC426	D-6
IC427	B-6
IC429	B-5
IC430	B-6
IC431	B-6
IC432	B-5
IC433	D-6
IC434	D-6
IC435	D-5
IC436	D-4
IC437	E-5
IC439	C-8
IC450	B-6
IC600	F-3
IC601	F-2
IC602	F-4
IC603	F-4
IC604	E-5
IC606	D-7
IC607	D-6
IC608	C-9
IC609	C-9
IC610	E-8
IC611	D-7
IC612	C-7
IC613	C-8
IC614	F-5
IC615	D-5
IC616	E-7
IC617	E-7
IC901	B-5
IC902	B-5
IC904	A-2

Test Points

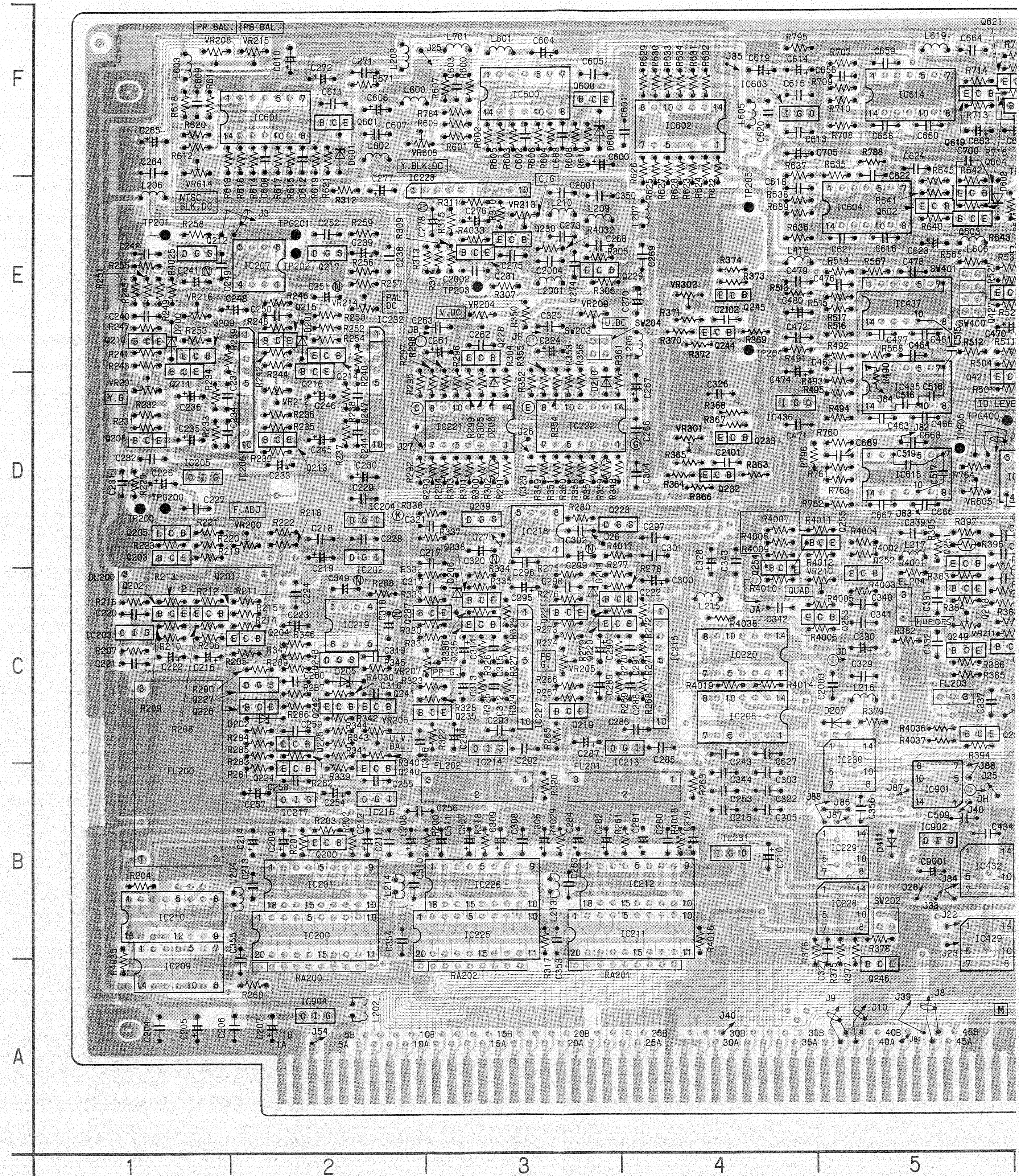
TP1	F-10
TP2	F-9
TP3	C-10
TP4	B-10
TP5	E-10
TP200	D-1
TP201	E-1
TP202	E-2
TP203	E-3
TP204	E-4
TP205	E-4
TP400	D-6
TP401	D-6
TP403	E-7
TP404	E-6
TP405	E-6
TP406	E-6
TP600	E-6
TP601	E-6
TP603	F-6
TP604	F-7
TP605	D-5
TPG1	C-10
TPG2	C-10
TPG200	D-1
TPG201	E-2
TPG400	D-5
TPG402	D-7
TPG600	F-7

Adjustments

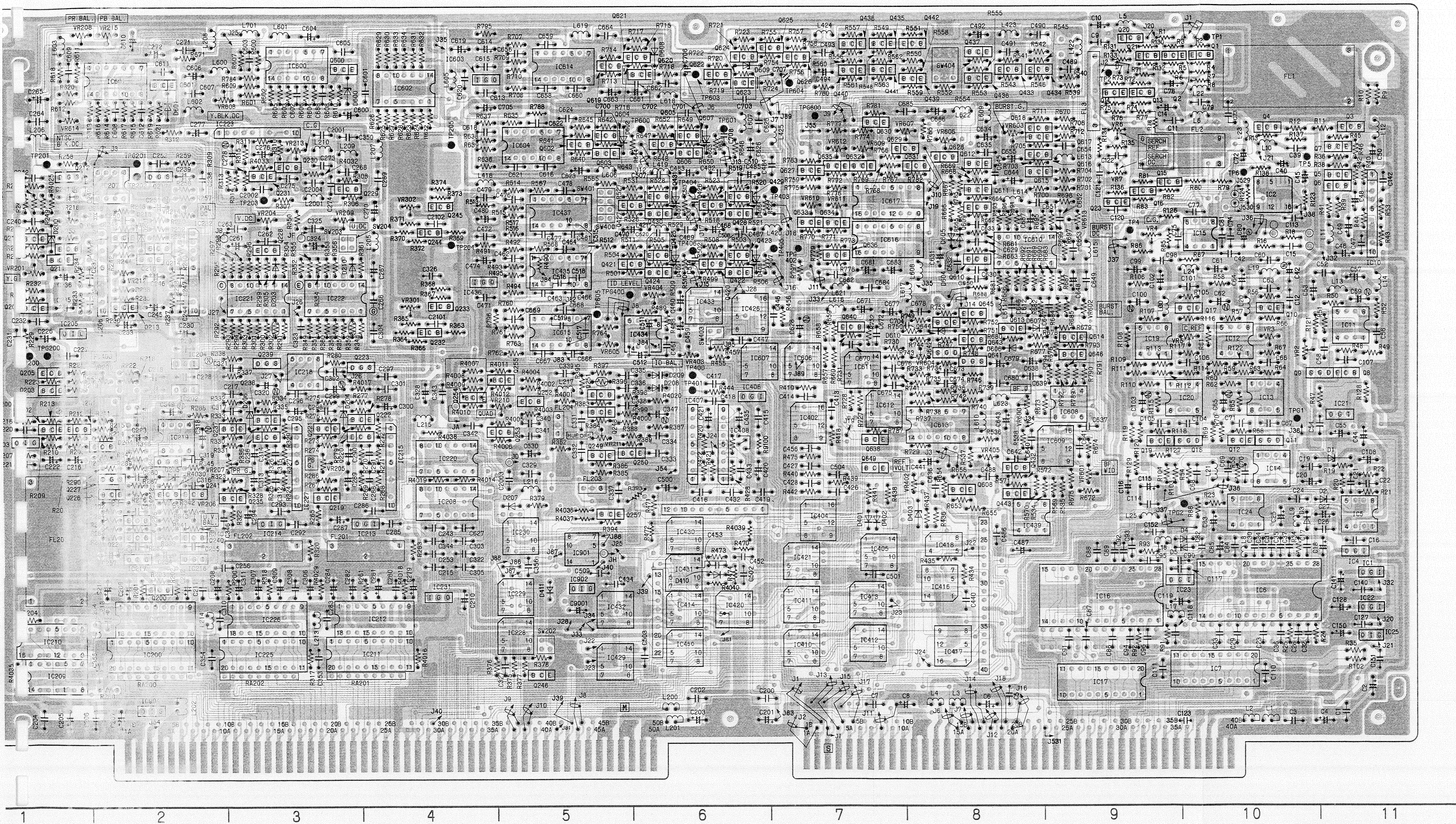
VR1	E-10
VR2	D-10
VR3	D-10
VR4	E-10
VR5	E-10
VR200	D-2
VR201	D-1
VR204	E-3
VR205	C-3
VR206	C-2
VR207	C-3
VR208	F-1
VR209	E-3
VR210	C-5
VR211	C-5
VR213	E-3
VR214	E-2
VR215	F-2
VR216	E-1
VR402	C-8
VR403	D-6
VR404	D-6
VR405	C-8
VR600	C-8
VR601	C-9
VR602	D-9
VR603	E-8
VR604	D-8
VR605	D-5
VR606	E-8
VR607	E-7
VR608	F-2
VR609	E-7
VR610	E-7
VR611	E-7
VR612	E-7
VR613	E-9
VR614	F-1

ADDRESS INFORMATION

L3 ENCODER P.C. BOARD (VEP88040A)



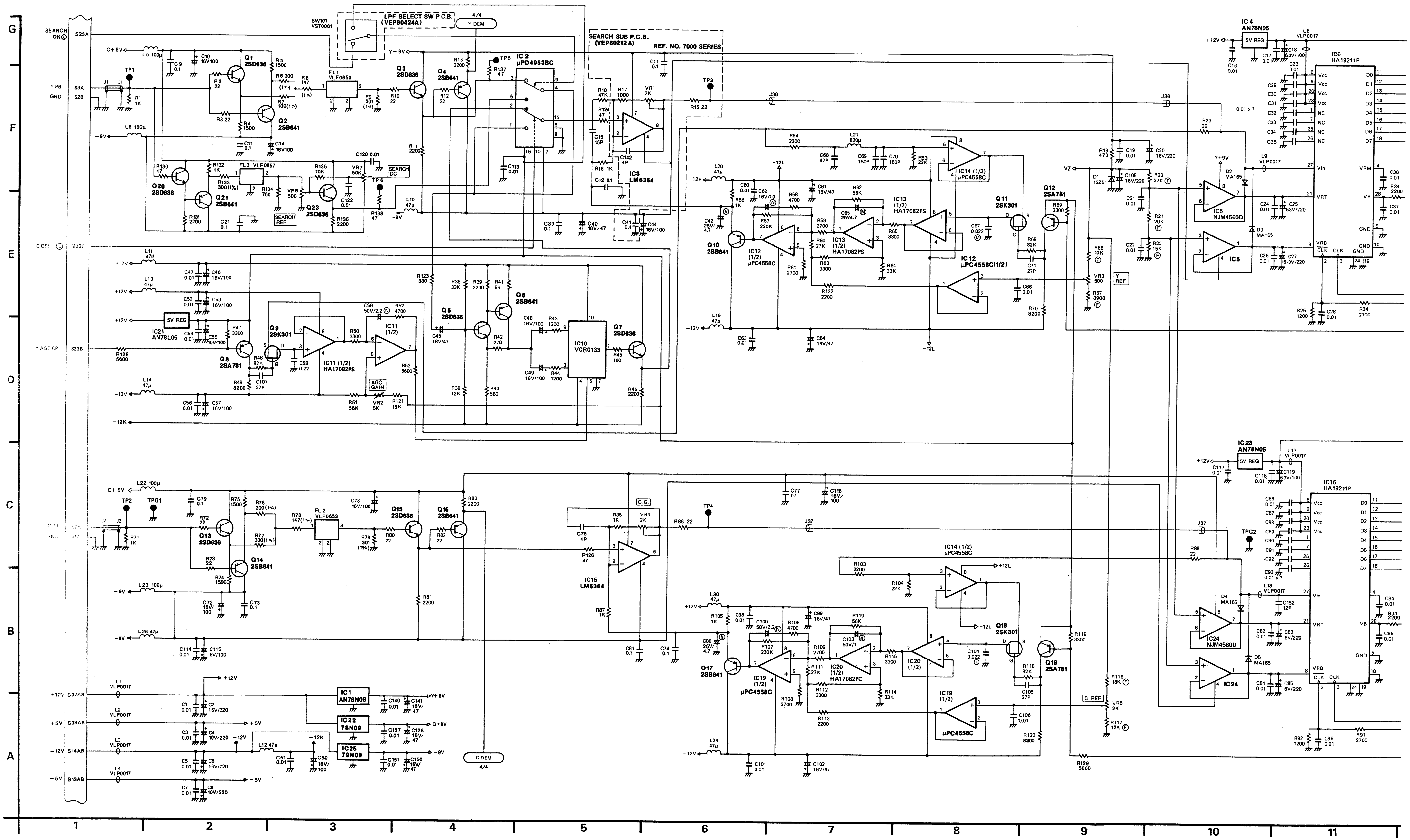
ODER P.C. BOARD (VEP88040A)

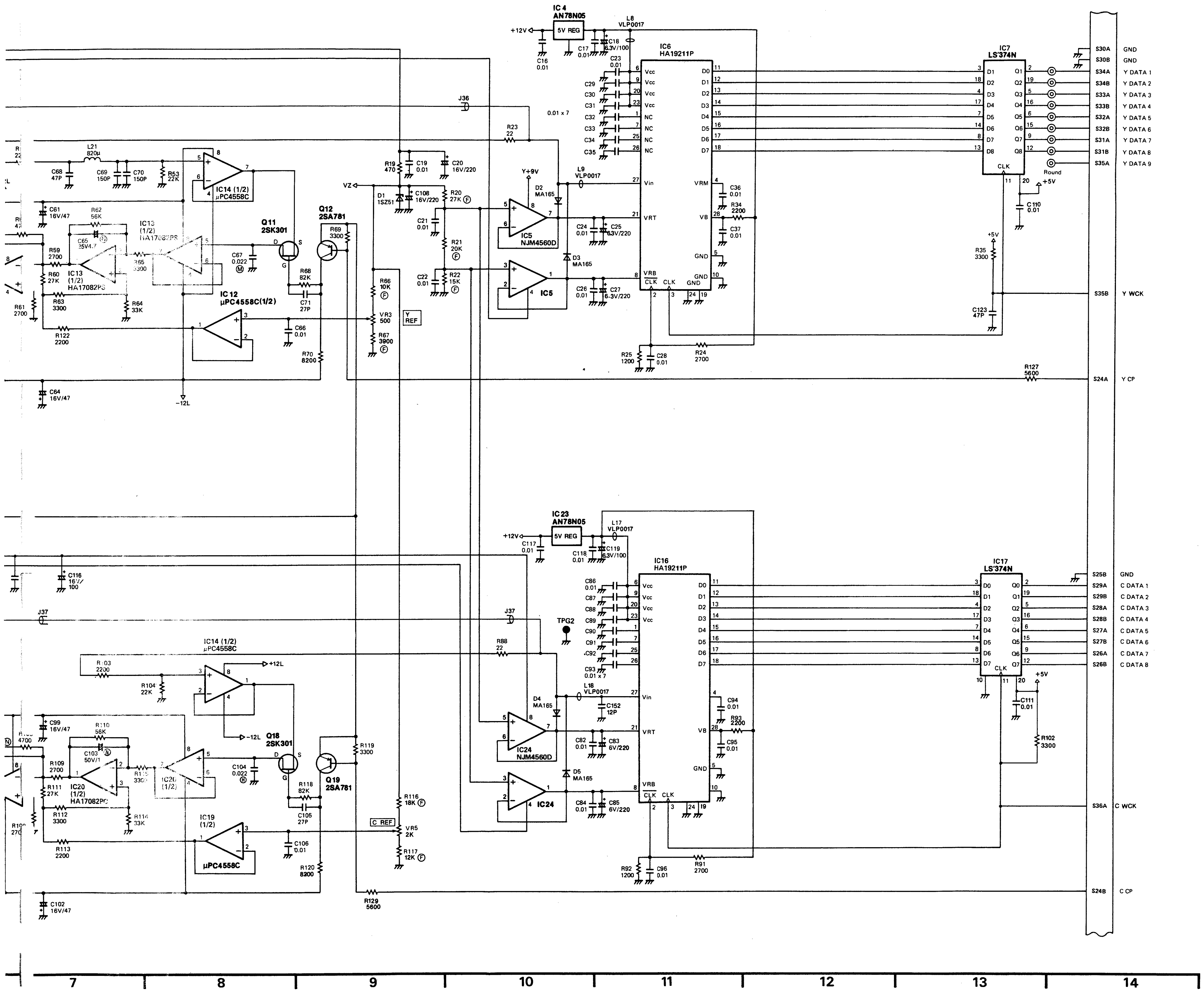


REVERSE SIDE

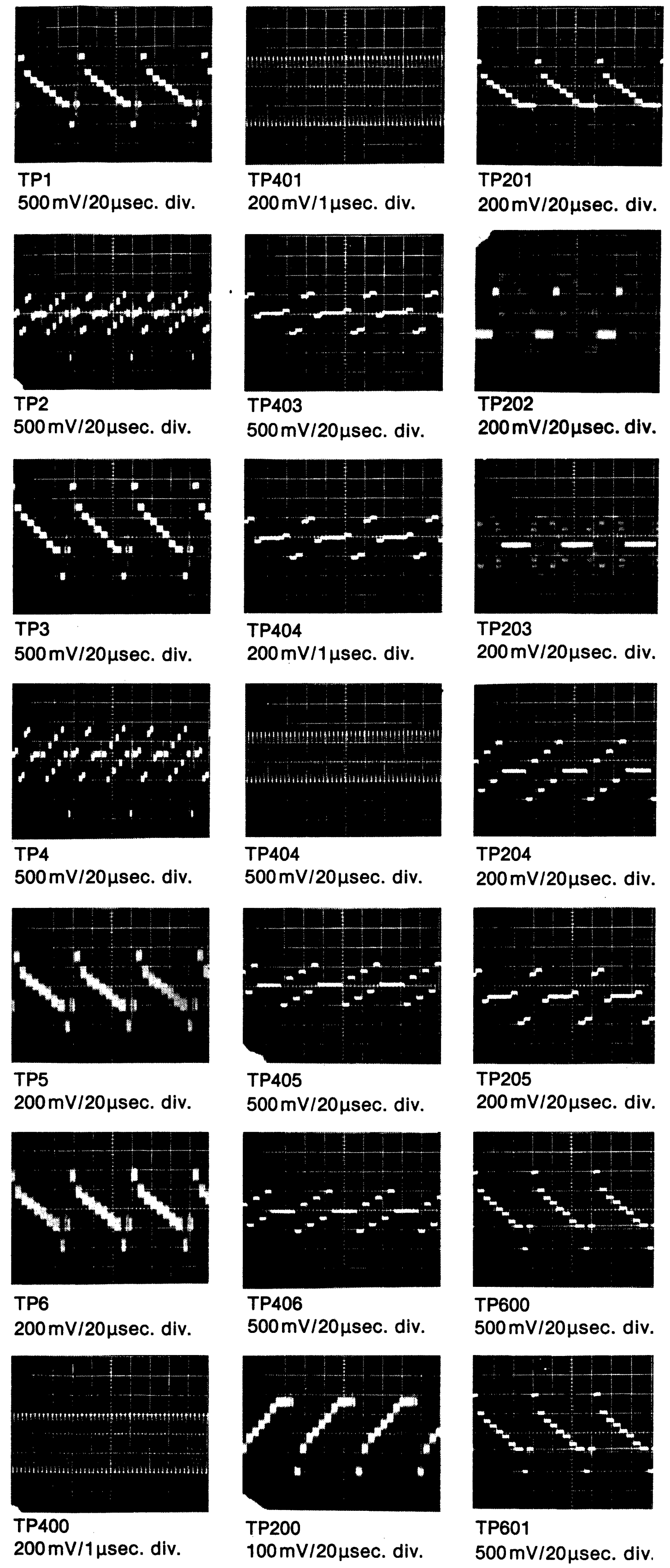
L3 ENCODER SCHEMATIC DIAGRAM (1/4)

L3 ENCODER SCHEMATIC DIAGRAM (1/4)

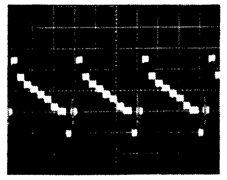




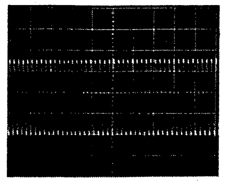
L3 ENCODER WAVEFORMS



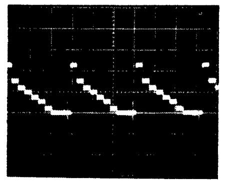
L3 ENCODER WAVEFORMS



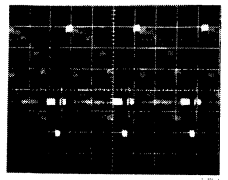
TP1
500mV/20μsec. div.



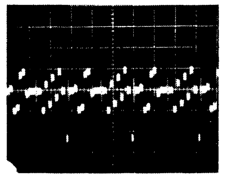
TP401
200mV/1μsec. div.



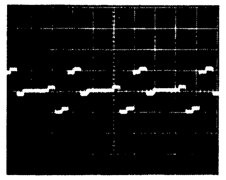
TP201
200mV/20μsec. div.



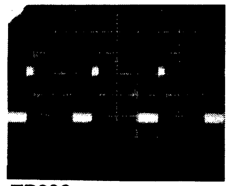
TP602
200mV/20μsec. div.



TP2
500mV/20μsec. div.

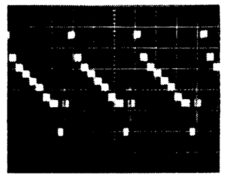


TP403
500mV/20μsec. div.

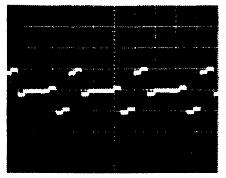


TP202
200mV/20μsec. div.

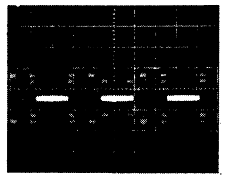
TP603/604
500mV/20μsec. div.



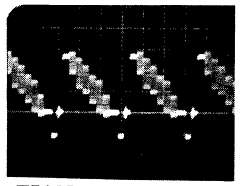
TP3
500mV/20μsec. div.



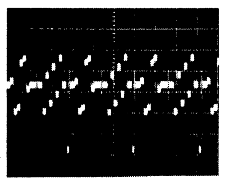
TP404
200mV/1μsec. div.



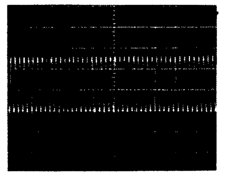
TP203
200mV/20μsec. div.



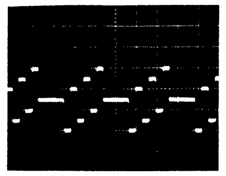
TP605
500mV/20μsec. div.



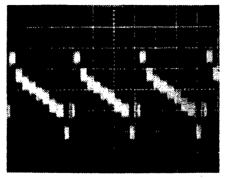
TP4
500mV/20μsec. div.



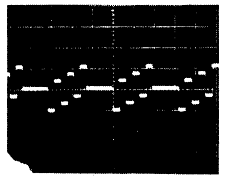
TP404
500mV/20μsec. div.



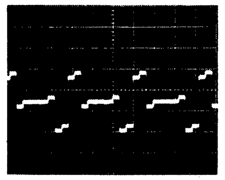
TP204
200mV/20μsec. div.



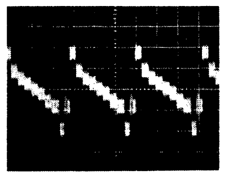
TP5
200mV/20μsec. div.



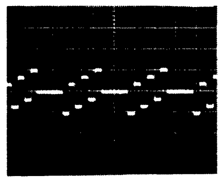
TP405
500mV/20μsec. div.



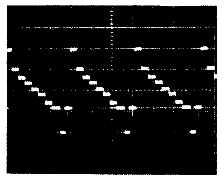
TP205
200mV/20μsec. div.



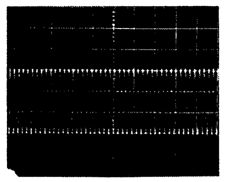
TP6
200mV/20μsec. div.



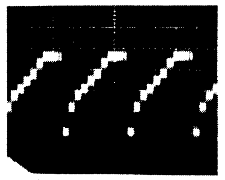
TP406
500mV/20μsec. div.



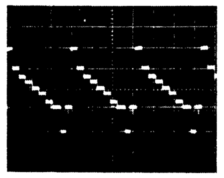
TP600
500mV/20μsec. div.



TP400
200mV/1μsec. div.



TP200
100mV/20μsec. div.



TP601
500mV/20μsec. div.

L-3M	ENCODER			
B		NO	A	
L2M-1A	–	1	GND	
L2M-2A	–	2	GND	
L2M-3A	–	3	–5V	
L2M-4A	–	4	–12V	L5M-4B
L2M-5A	–	5	–12V	L5M-4B
L1M-8B	YR CLK	6	GND	L1M-8A
L1M-44A	RST	7	WFM A	P16–8
P16-10	WFM C	8	WFM B	P16–9
L1M-9B L6M27B	V#1 (L)	9		
L1M-10B	R BLK	10	R BF	L1M-10A
L1M-11B	R SYNC	11	V#2	L1M-11A
L1M-12B	Y DATA 8	12	Y DATA 7	L1M-12A
L1M-13B	Y DATA 6	13	Y DATA 5	L1M-13A
L1M-14B	Y DATA 4	14	Y DATA 3	L1M-14A
L1M-15B	Y DATA 2	15	Y DATA 1	L1M-15A
L1M-16B	GND	16	Y DATA 9	L1M-16A
L1M-17B	PR DATA 8	17	PR DATA 7	L1M-17A
L1M-18B	PR DATA 6	18	PR DATA 5	L1M-18A
L1M-19B	PR DATA 4	19	PR DATA 3	L1M-19A
L1M-20B	PR DATA 2	20	PR DATA 1	L1M-20A
L1M-21B	Y DOP (L)	21		
L1M-22B	PB DATA 8	22	PB DATA 7	L1M-22A
L1M-23B	PB DATA 6	23	PB DATA 5	L1M-23A
L1M-24B	PB DATA 4	24	PB DATA 3	L1M-24A
L1M-25B	PB DATA 2	25	PB DATA 1	L1M-25A
L1M-26B	–	26	GND	L1M-26A
L1M-27B	R 4fSC	27	GND	L1M-27A
L1M-28B	R SC	28	GND	L1M-28A
L1M-29B	PAL SW	29	12 LINE P	L1M-29A
P16–1	SET UP	30	HUE	P16–2
P16–3	VIDEO GAIN	31	Y GAIN	P16–4
P16–5	PR GAIN	32	PB GAIN	P16–6
L1M-40B	GND	33	C GAIN	P16–7
	GND	34	CHARACTER IN	L6M-15A
L1S-3B	TBC CF	35	CHARACTER GATE	L6M-16A
L2S-36B	C OFF (L)	36	REV SEARCH (L)	L5S-30B
P18–2	GND	37	WFM Y RF	P18–1
P18–4	GND	38	WFM C RF	P18–3
		39		
L1M-43B	VISC CONT	40	GND	L1M-43A
L6S-20A	V# CF (L)	41	PHASE INH	L6M-35A
	GND	42	ID OFF (L)	L6S-8B
P12–8	GND	43	WFM OUT	P12–7
		44		
L2M-45A	–	45	+12V	L5M-48B
L2M-46A	–	46	+12V	L5M-48B
L2M-47A	–	47	+5V	L4S-38B
L2M-48A	–	48	+5V	L4S-38B
L2M-49A	–	49	GND	
L2M-50A	–	50	GND	

L-3S	ENCODER			
B		NO	A	
L2S-1A	GND	1	GND	L2S-17B, 18B
P25–1,3	GND	2	C PB	L2S-17A P25–2
P36–1	B/W (L)	3	Y PB	L2S-18A P25–4
P37–3	SMPTE PB	4	SMPTE Y	P37–1
P37–5	SMPTE PR	5	GND	P37–2,4,6
P36–6	BURST GAIN	6	SYNC GAIN	P36–7
P36–8	WFM D	7		
P36-9	WFM E	8		
L1S-9B	4LP	9	EE (L)	L5M-18B L2M-44A
		10	SERVO LOCK	L5M-33B
L2S-11A	–	11	GND	
L2S-12A	–	12	GND	
L2S-13A	–	13	–5V	POWER2–2 L6S-36B
L2S-14A	–	14	–12V	L5S-35B
P7–2	GND	15	VIDEO 1 OUT	P7–1
P7–4	GND	16	VIDEO 2 OUT	P7–3
P7–6	GND	17	VIDEO 3 OUT	P7–5
P7–8	GND	18	Y OUT	P7–7
P7–10	GND	19	PR OUT	P7–9
P7–12	GND	20	PB OUT	P7–11
P46-2	GND	21	PB PCM Y2	P46-1
P46-4	GND	22	PB PCM C2	P46-3
L2S-25B	Y AGC CP	23	SEARCH ON (L)	L2S-27A
L2S-26B	C CP	24	Y CP	L2S-26A
L1S-25B	GND	25		
L1S-26B	C DATA 8	26	C DATA 7	L1S-26A
L1S-27B	C DATA 6	27	C DATA 5	L1S-27A
L1S-28B	C DATA 4	28	C DATA 3	L1S-28A
L1S-29B	C DATA 2	29	C DATA 1	L1S-29A
L1S-30B	–	30	GND	L1S-30A
L1S-31B	Y DATA 8	31	Y DATA 7	L1S-31A
L1S-32B	Y DATA 6	32	Y DATA 5	L1S-32A
L1S-33B	Y DATA 4	33	Y DATA 3	L1S-33A
L1S-34B	Y DATA 2	34	Y DATA 1	L1S-34A
L2S-35B	Y WCK	35	Y DATA 9	L1S-35A
L2S-36B	GND	36	CWCK	L2S-36A
L2S-37A	–	37	+12V	L5S-26B
L2S-15A,16A,38A	–	38	+5V	L5S-38B
L2S-39A	–	39	GND	
L2S-40A	–	40	GND	

	P7		
L3S-15A	1	VIDEO 1 OUT	P308-10
L3S-15B	2	GND	P308-9
L3S-16A	3	VIDEO 2 OUT	P308-8
L3S-16B	4	GND	P308-7
L3S-17A	5	VIDEO 3 OUT	P308-6
L3S-17B	6	GND	P308-5
L3S-18A	7	Y OUT	P306-1
L3S-18B	8	GND	P306-2
L3S-19A	9	PR OUT	P306-3
L3S-19B	10	GND	P306-4
L3S-20A	11	PB OUT	P306-5
L3S-20B	12	GND	P306-6

To JACK

	P12		
	1		
	2		
L1M-6B	3	REV VIDEO	P301-9
L1M-6A	4	GND	P301-10
	5		
	6		
L3M-43A	7	WFM OUT	P308-2
L3M-43B	8	GND	P308-1
L1S-9A	9	BS OUT	P306-4
L1S-11A	10	GND	P306-3

To JACK

To FRONT

	P16		
L3M-30B	1	SET UP	P101-8
L3M-30A	2	HUE	P101-9
L3M-31B	3	VIDEO GAIN	P101-6
L3M-31A	4	Y GAIN	P101-4
L3M-32B	5	PR GAIN	P108-6
L3M-32A	6	PB GAIN	P108-5
L3M-33A	7	C GAIN	P101-7
L3M-7A	8	WFM A	P106-1
L3M-8A	9	WFM B	P106-2
L3M-8B	10	WFM C	P106-3

To S#

	P18		
L3M-37A	1	WFM Y RF	P57-8
L3M-37B	2	GND	P57-7
L3M-38A	3	WFM C RF	P57-6
L3M-38B	4	GND	P57-5

To S#

	P25		
L3S-2B	1	GND	P59-5
L3S-2A	2	C PB	P59-6
L3S-2B L6M-26A	3	GND	P59-7
L3S-3A L6M-26B	4	Y PB	P59-8
	5		
L6S-23B	6	PCM DET	P62-8

To FRONT

	P36		
L3S-3B	1	B/W (L)	P114-4
L1S-4B	2	VIDEO #1	P106-8
L1S-4A	3	VIDEO #2	P106-9
L1S-5B	4	VIDEO #3	P106-10
L1S-15A	5	VIDEO #4	P106-10
L3S-6B	6	BURST GAIN	P108-3
L3S-6A	7	SYNC GAIN	P108-2
L3S-7B	8	WFM D	P106-7
L3S-8B	9	WFM E	
L6S-24B	10	PCM ON (L)	

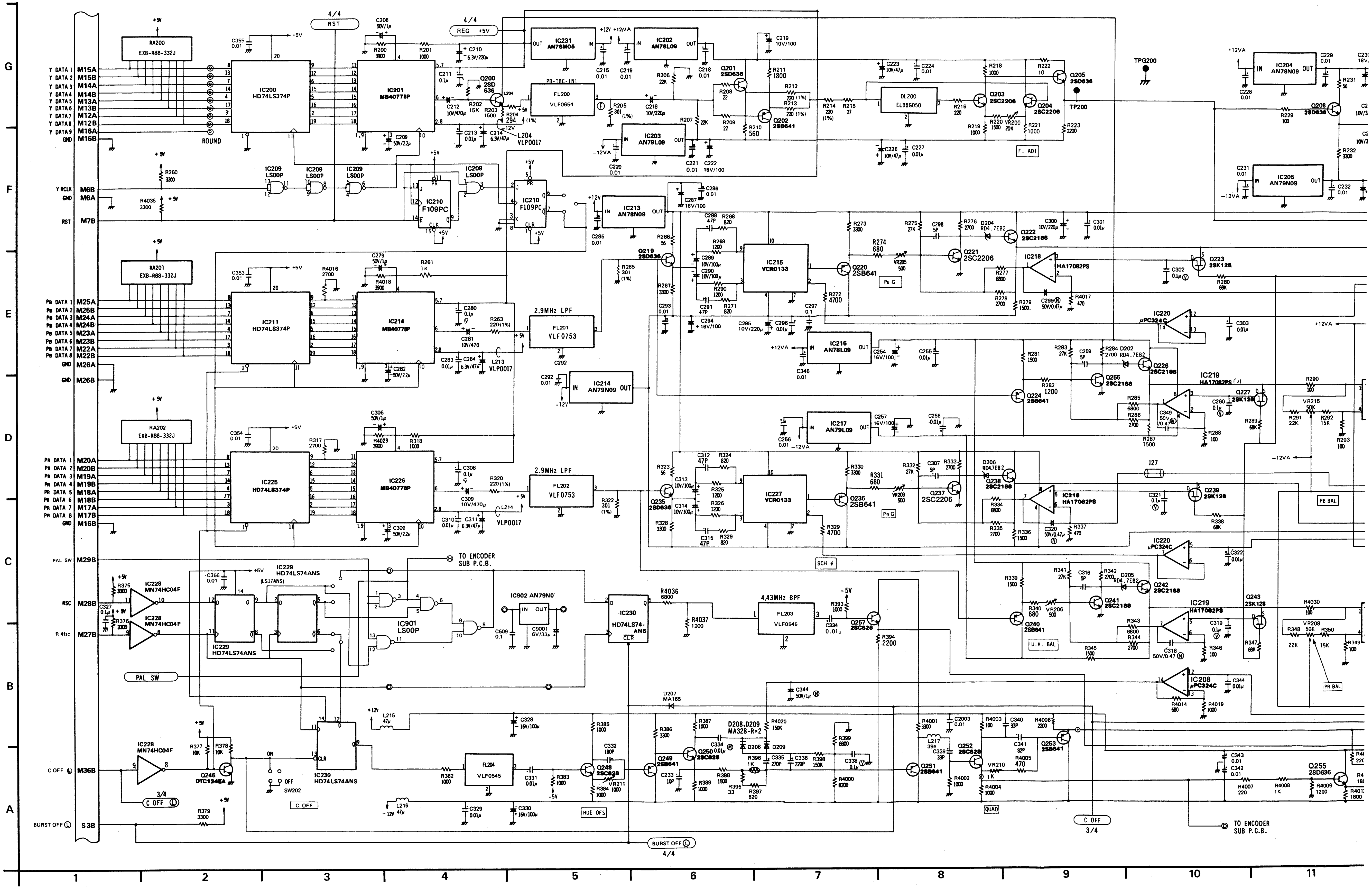
	P37		
L3S-4A	1	SMPTE Y	CNO-6
L3S-5A	2	GND	CNO-5
L3S-4B	3	SMPTE PB	CNO-4
L3S-5A	4	GND	CNO-3
L3S-5B	5	SMPTE PR	CNO-2
L3S-5A	6	GND	CNO-1

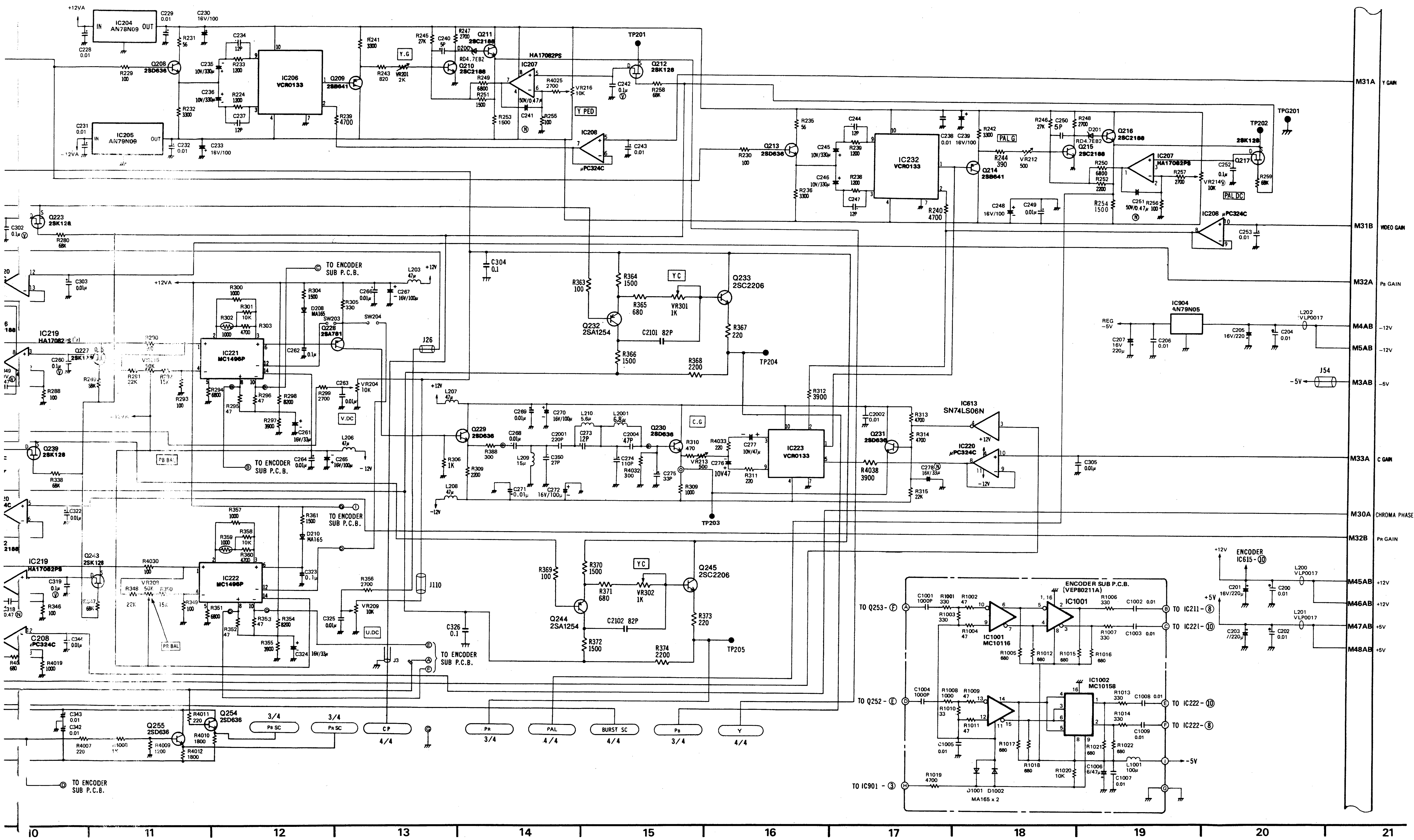
To JACK

To S#

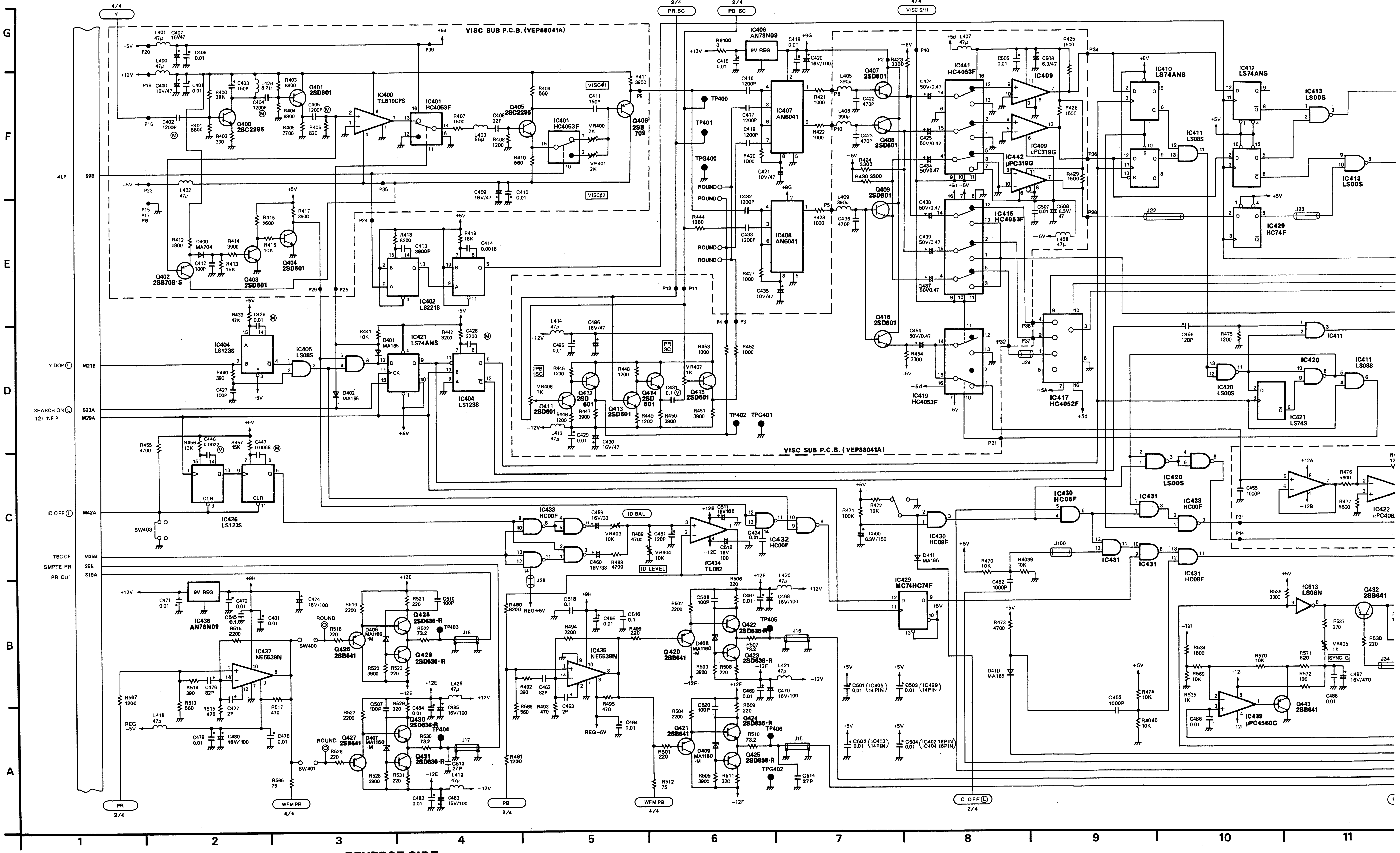
	POWER 2		
L5S-35A	1	-12V	POWERS-1
L3S-13A	2	-5V	POWERS-2
—	3	GND	POWERS-3
—	4	GND	POWERS-4
—	5	+12V (L)	POWERS-5
—	6		POWERS-6
POWER1 1,2 L5M-3A L5S-37A	7	+5V	POWERS-7

L3 ENCODER SCHEMATIC DIAGRAM (2/4)



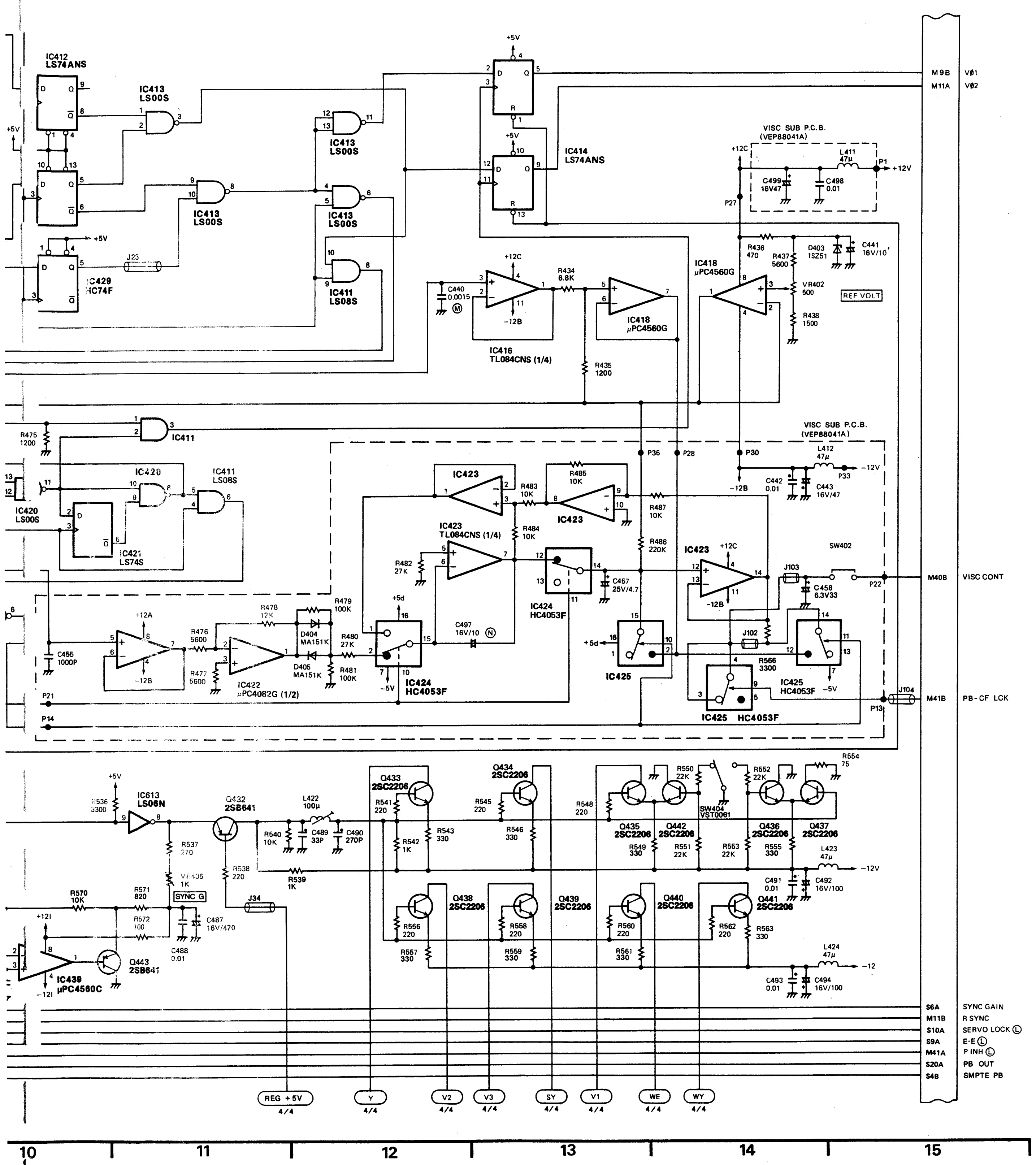


L3 ENCODER SCHEMATIC DIAGRAM (3/4)



REVERSE SIDE

L3 ENCODER
SCHEMATIC DIAGRAM (2/4)



L-3M	ENCODER			
B		NO	A	
L2M-1A	–	1	GND	
L2M-2A	–	2	GND	
L2M-3A	–	3	–5V	
L2M-4A	–	4	–12V	L5M-4B
L2M-5A	–	5	–12V	L5M-4B
L1M-8B	YR CLK	6	GND	L1M-8A
L1M-44A	RST	7	WFM A	P16–8
P16-10	WFM C	8	WFM B	P16–9
L1M-9B / L6M27B	VØ1 (L)	9		
L1M-10B	R BLK	10	R BF	L1M-10A
L1M-11B	R SYNC	11	VØ2	L1M-11A
L1M-12B	Y DATA 8	12	Y DATA 7	L1M-12A
L1M-13B	Y DATA 6	13	Y DATA 5	L1M-13A
L1M-14B	Y DATA 4	14	Y DATA 3	L1M-14A
L1M-15B	Y DATA 2	15	Y DATA 1	L1M-15A
L1M-16B	GND	16	Y DATA 9	L1M-16A
L1M-17B	PR DATA 8	17	PR DATA 7	L1M-17A
L1M-18B	PR DATA 6	18	PR DATA 5	L1M-18A
L1M-19B	PR DATA 4	19	PR DATA 3	L1M-19A
L1M-20B	PR DATA 2	20	PR DATA 1	L1M-20A
L1M-21B	Y DOP (L)	21		
L1M-22B	PB DATA 8	22	PB DATA 7	L1M-22A
L1M-23B	PB DATA 6	23	PB DATA 5	L1M-23A
L1M-24B	PB DATA 4	24	PB DATA 3	L1M-24A
L1M-25B	PB DATA 2	25	PB DATA 1	L1M-25A
L1M-26B	–	26	GND	L1M-26A
L1M-27B	R 4fSC	27	GND	L1M-27A
L1M-28B	R SC	28	GND	L1M-28A
L1M-29B	PAL SW	29	12 LINE P	L1M-29A
P16–1	SET UP	30	HUE	P16–2
P16–3	VIDEO GAIN	31	Y GAIN	P16–4
P16–5	PR GAIN	32	PB GAIN	P16–6
L1M-40B	GND	33	C GAIN	P16–7
	GND	34	CHARACTER IN	L6M-15A
L1S-3B	TBC CF	35	CHARACTER GATE	L6M-16A
L2S-36B	C OFF (L)	36	REV SEARCH (L)	L5S-30B
P18–2	GND	37	WFM Y RF	P18–1
P18–4	GND	38	WFM C RF	P18–3
		39		
L1M-43B	VISC CONT	40	GND	L1M-43A
L6S-20A	VØ CF (L)	41	PHASE INH	L6M-35A
	GND	42	ID OFF (L)	L6S-8B
P12–8	GND	43	WFM OUT	P12–7
		44		
L2M-45A	–	45	+12V	L5M-48B
L2M-46A	–	46	+12V	L5M-48B
L2M-47A	–	47	+5V	L4S-38B
L2M-48A	–	48	+5V	L4S-38B
L2M-49A	–	49	GND	
L2M-50A	–	50	GND	

L-3S	ENCODER				
B		NO	A		
L2S-1A	GND	1	GND	L2S-17B, 18B	
P25–1,3	GND	2	C PB	L2S-17A	P25–2
P36–1	B/W (L)	3	Y PB	L2S-18A	P25–4
P37–3	SMPTE PB	4	SMPTE Y	P37–1	
P37–5	SMPTE PR	5	GND	P37–2,4,6	
P36–6	BURST GAIN	6	SYNC GAIN	P36–7	
P36–8	WFM D	7			
P36-9	WFM E	8			
L1S-9B	4LP	9	EE (L)	L5M-18B	L2M-44A
		10	SERVO LOCK	L5M-33B	
L2S-11A	–	11	GND		
L2S-12A	–	12	GND		
L2S-13A	–	13	–5V	POWER2–2, L6S-36B	
L2S-14A	–	14	–12V	L5S-35B	
P7–2	GND	15	VIDEO 1 OUT	P7–1	
P7–4	GND	16	VIDEO 2 OUT	P7–3	
P7–6	GND	17	VIDEO 3 OUT	P7–5	
P7–8	GND	18	Y OUT	P7–7	
P7–10	GND	19	PR OUT	P7–9	
P7–12	GND	20	PB OUT	P7–11	
P46-2	GND	21	PB PCM Y2	P46-1	
P46-4	GND	22	PB PCM C2	P46-3	
L2S-25B	Y AGC CP	23	SEARCH ON (L)	L2S-27A	
L2S-26B	C CP	24	Y CP	L2S-26A	
L1S-25B	GND	25			
L1S-26B	C DATA 8	26	C DATA 7	L1S-26A	
L1S-27B	C DATA 6	27	C DATA 5	L1S-27A	
L1S-28B	C DATA 4	28	C DATA 3	L1S-28A	
L1S-29B	C DATA 2	29	C DATA 1	L1S-29A	
L1S-30B	–	30	GND	L1S-30A	
L1S-31B	Y DATA 8	31	Y DATA 7	L1S-31A	
L1S-32B	Y DATA 6	32	Y DATA 5	L1S-32A	
L1S-33B	Y DATA 4	33	Y DATA 3	L1S-33A	
L1S-34B	Y DATA 2	34	Y DATA 1	L1S-34A	
L2S-35B	Y WCK	35	Y DATA 9	L1S-35A	
L2S-36B	GND	36	CWCK	L2S-38A	
L2S-37A	–	37	+12V	L5S-26B	
L2S-15A,16A,38A	–	38	+5V	L5S-38B	
L2S-39A	–	39	GND		
L2S-40A	–	40	GND		

P7			
L3S-15A	1	VIDEO 1 OUT	P308 -10
L3S-15B	2	GND	P308 - 9
L3S-16A	3	VIDEO 2 OUT	P308 - 8
L3S-16B	4	GND	P308 - 7
L3S-17A	5	VIDEO 3 OUT	P308 - 6
L3S-17B	6	GND	P308 - 5
L3S-18A	7	Y OUT	P306 - 1
L3S-18B	8	GND	P306 - 2
L3S-19A	9	PR OUT	P306 - 3
L3S-19B	10	GND	P306 - 4
L3S-20A	11	PB OUT	P306 - 5
L3S-20B	12	GND	P306 - 6

To JACK

P12			
	1		
	2		
L1M-6B	3	REV VIDEO	P301 - 9
L1M-6A	4	GND	P301 -10
	5		
	6		
L3M-43A	7	WFM OUT	P308 - 2
L3M-43B	8	GND	P308 - 1
L1S - 9A	9	BS OUT	P308 - 4
L1S-11A	10	GND	P308 - 3

To JACK

To FRONT

P16			
L3M-30B	1	SET UP	P101 - 8
L3M-30A	2	HUE	P101 - 9
L3M-31B	3	VIDEO GAIN	P101 - 6
L3M-31A	4	Y GAIN	P108 - 4
L3M-32B	5	PR GAIN	P108 - 6
L3M-32A	6	PB GAIN	P108 - 5
L3M-33A	7	C GAIN	P101 - 7
L3M-7A	8	WFM A	P106 - 1
L3M-8A	9	WFM B	P106 - 2
L3M-8B	10	WFM C	P106 - 3

To SØ

P18			
L3M-37A	1	WFM Y RF	P57 - 8
L3M-37B	2	GND	P57 - 7
L3M-38A	3	WFM C RF	P57 - 6
L3M-38B	4	GND	P57 - 5

To SØ

P25			
L3S-2B	1	GND	P59-5
L3S-2A	2	C PB	P59-6
L3S-2B L6M-26A	3	GND	P59-7
L3S-3A L6M-26B	4	Y PB	P59-8
	5		
L6S-23B	6	PCM DET	P62-8

To FRONT

P36			
L3S-3B	1	B/W (L)	P114 - 4
L1S-4B	2	VIDEO #1	P106 - 8
L1S-4A	3	VIDEO #2	P106 - 9
L1S-5B	4	VIDEO #3	P106 - 10
L1S-15A	5	VIDEO #4	P108 - 10
L3S-6B	6	BURST GAIN	P108 - 3
L3S-6A	7	SYNC GAIN	P108 - 2
L3S-7B	8	WFM D	P106 - 7
L3S-8B	9	WFM E	
L6S-24B	10	PCM ON (L)	

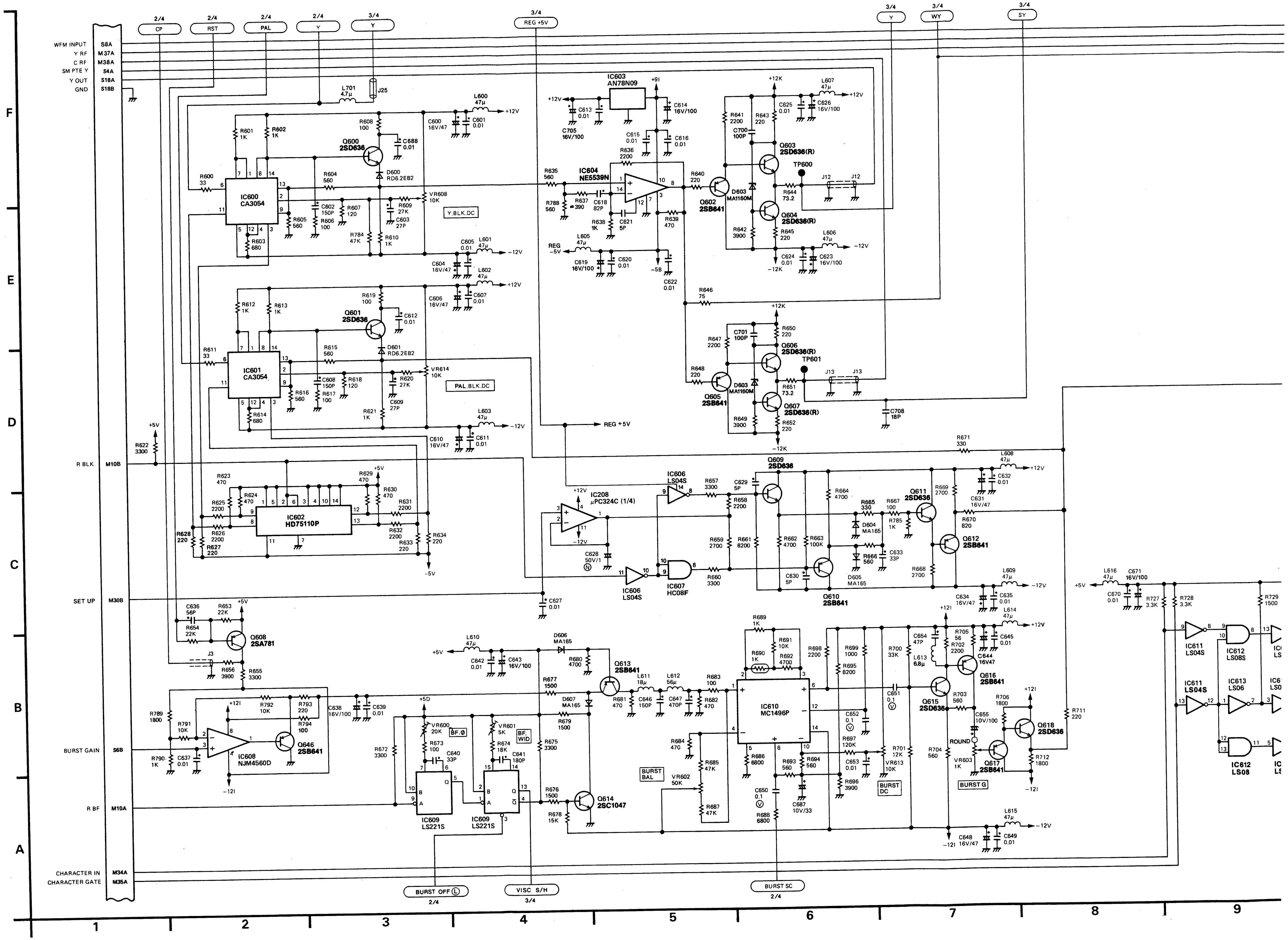
P37			
L3S-4A	1	SMPTE Y	CNO - 6
L3S-5A	2	GND	CNO - 5
L3S-4B	3	SMPTE PB	CNO - 4
L3S-5A	4	GND	CNO - 3
L3S-5B	5	SMPTE PR	CNO - 2
L3S-5A	6	GND	CNO - 1

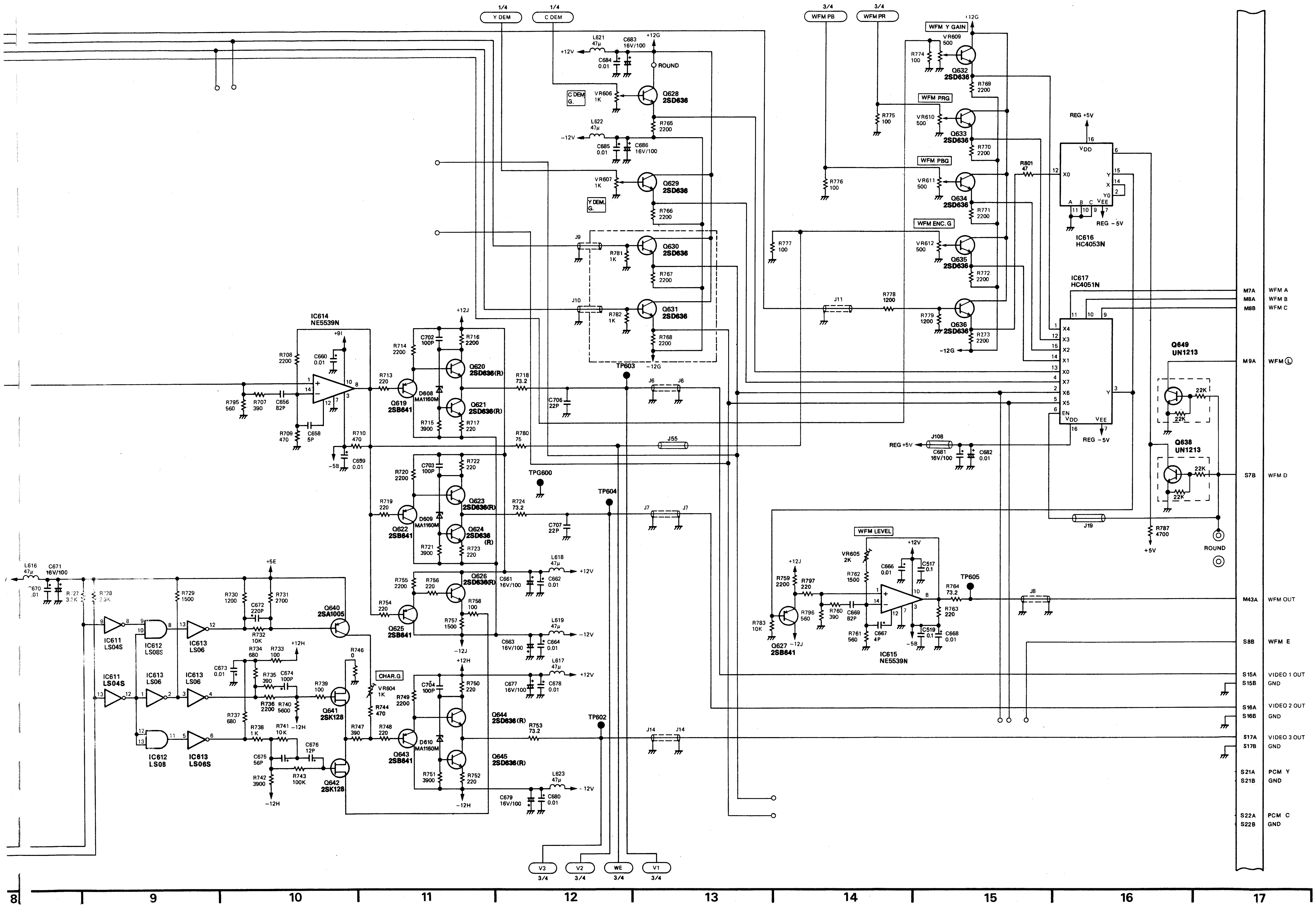
To JACK

To SØ

POWER 2			
L5S-35A	1	–12V	POWER5 - 1
L3S-13A	2	- 5V	POWER5 - 2
—	3	GND	POWER5 - 3
—	4	GND	POWER5 - 4
—	5	+12V (L)	POWER5 - 5
—	6		POWER5 - 6
POWER1 1.2 L5M-3A L5S-37A	7	+5V	POWER5 - 7

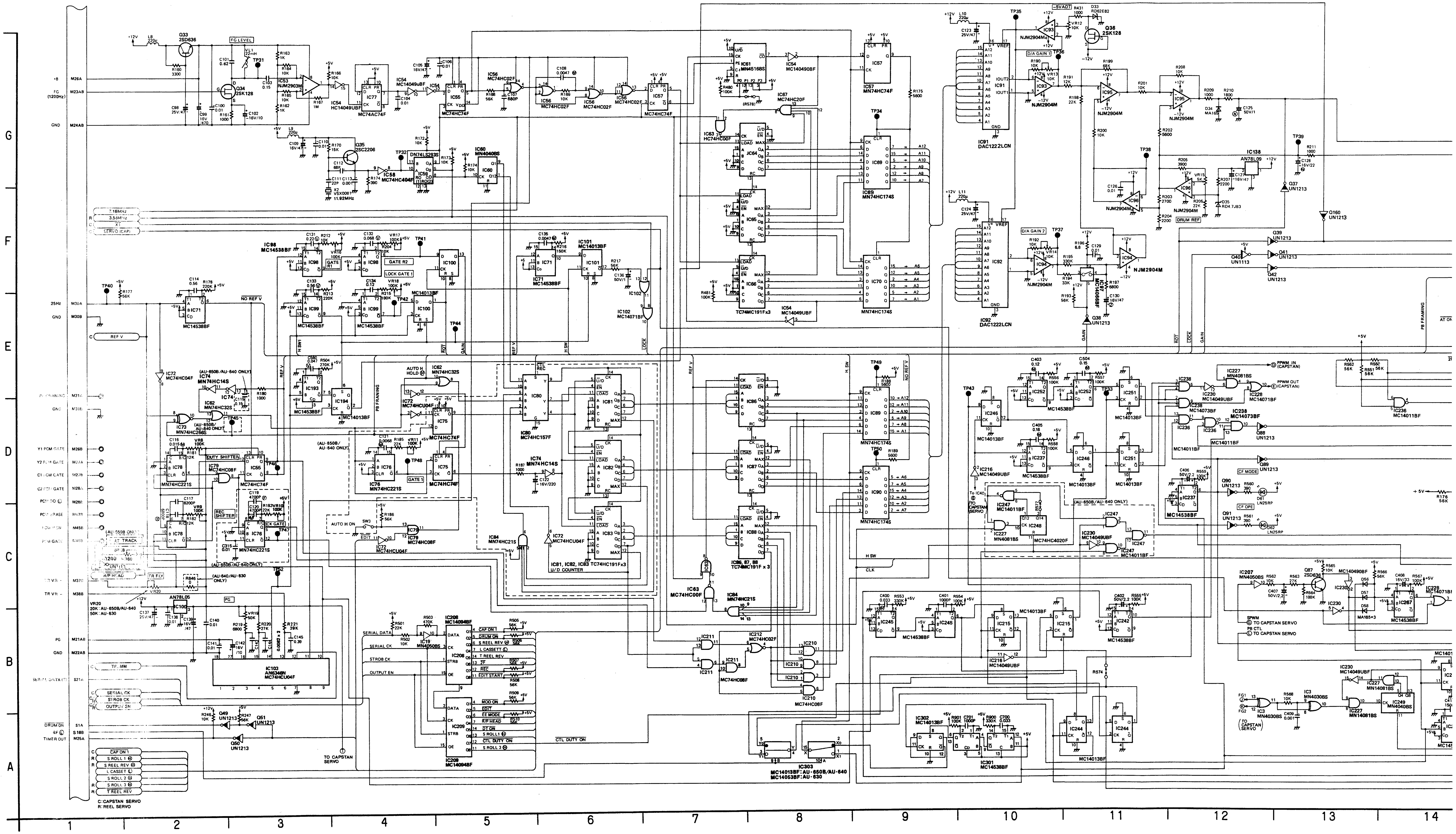
L3 ENCODER SCHEMATIC DIAGRAM (4/4)





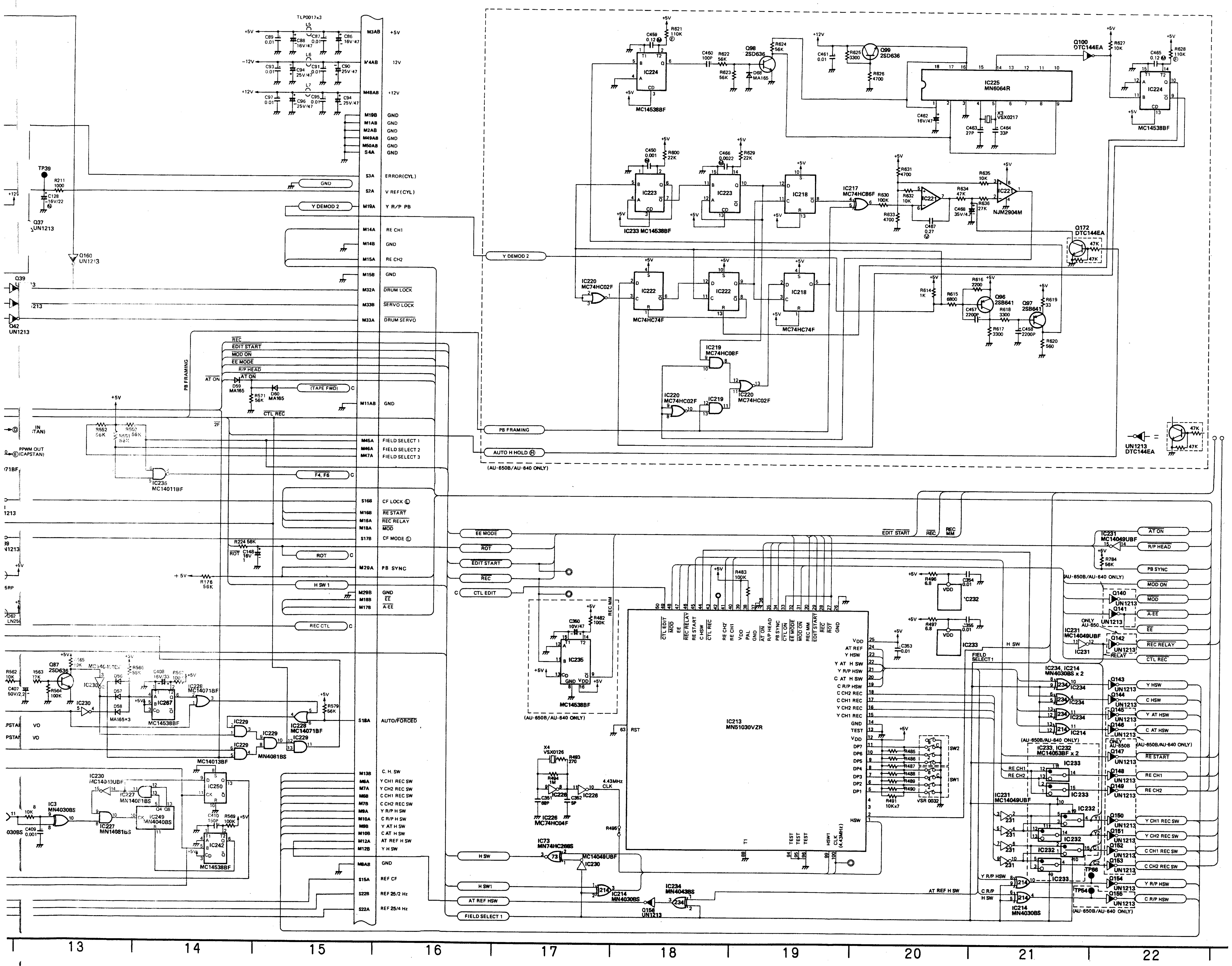
1/4 Y DEM
1/4 C DEM
3/4 WFM PB
3/4 WFM PR
ROUND
Q628 2SD636
Q629 2SD636
Q630 2SD636
Q631 2SD636
C DEM G.
Y DEM. G.
WFM Y GAIN
WFM PRG
WFM PBG
WFM ENC. G
Q632 2SD636
Q633 2SD636
Q634 2SD636
Q635 2SD636
Q636 2SD636
REG +5V
REG -5V
IC616 HC4053N
IC617 HC4051N
IC614 NE5539N
Q619 2SB641
Q620 2SD636(R)
Q621 2SD636(R)
D608 MA1160M
Q622 2SB641
Q623 2SD636(R)
Q624 2SD636(R)
D609 MA1160M
Q625 2SB641
Q626 2SD636(R)
TP603
TPG600
TP604
TP602
TP605
Q640 2SA1005
Q641 2SK128
Q642 2SK128
CHAR.G
Q643 2SB641
Q644 2SD636(R)
Q645 2SD636(R)
D610 MA1160M
IC611 LS04S
IC612 LS08S
IC613 LS06
IC612 LS08
IC613 LS06S
Q649 UN1213
Q638 UN1213
WFM LEVEL
IC615 NE5539N
Q627 2SB641
M7A WFM A
M8A WFM B
M8B WFM C
M9A WFM Ⓛ
S7B WFM D
M43A WFM OUT
S8B WFM E
S15A VIDEO 1 OUT
S15B GND
S16A VIDEO 2 OUT
S16B GND
S17A VIDEO 3 OUT
S17B GND
S21A PCM Y
S21B GND
S22A PCM C
S22B GND
V3 3/4
V2 3/4
WE 3/4
V1 3/4
8 9 10 11 12 13 14 15 16 17

L5 DRUM SERVO SCHEMATIC DIAGRAM

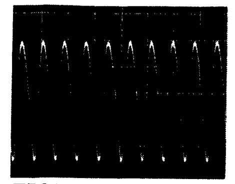


REVERSE SIDE

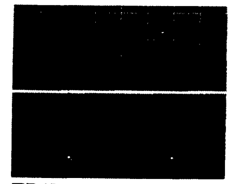
L3 ENCODER
SCHEMATIC DIAGRAM (4/4)



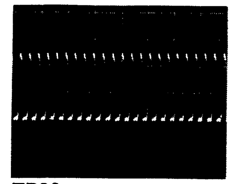
L5 DRUM SERVO WAVEFORMS



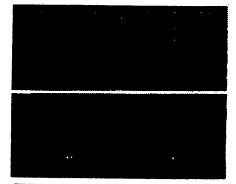
TP31
500mV/1msec. div.



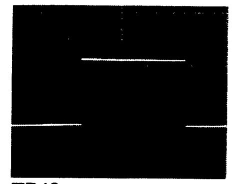
TP47
2V/5msec. div.



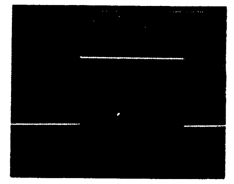
TP32
2V/0.2μsec. div.



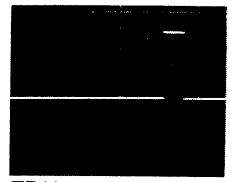
TP48
2V/5msec. div.



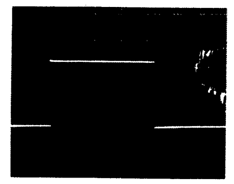
TP40
2V/5msec. div.



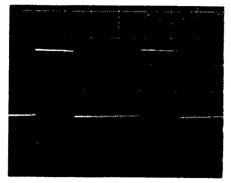
TP52
2V/5msec. div.



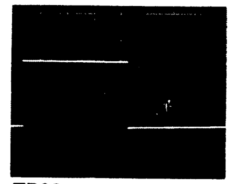
TP41
2V/5msec. div.



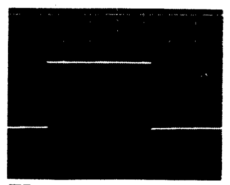
TP56
2V/5msec. div.



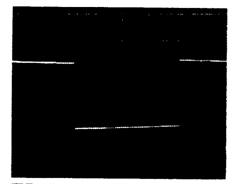
TP42
2V/10msec. div.



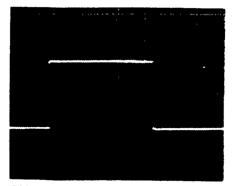
TP66
2V/5msec. div.



TP45
2V/5msec. div.

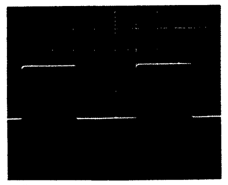


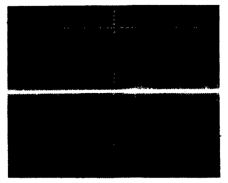
TP200 (CF SELECT)
2V/10msec. div.

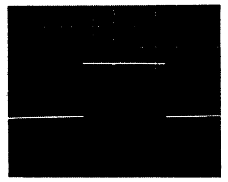


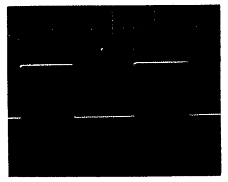
TP46
2V/5msec. div.

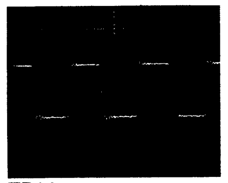
L5 CAPSTAN SERVO WAVEFORMS

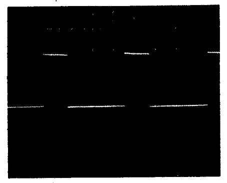

TP4
2V/0.1msec. div.

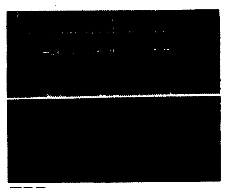

TP13
2V/10msec. div.

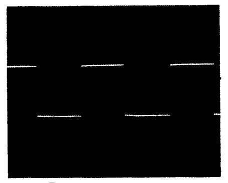

TP25
2V/5msec. div.

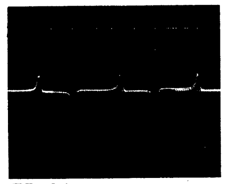

TP5
2V/0.1msec. div.

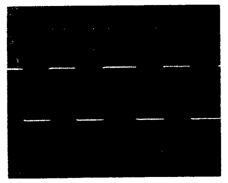

TP14
2V/0.1μsec. div.

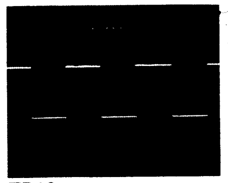

TP26
2V/10msec. div.

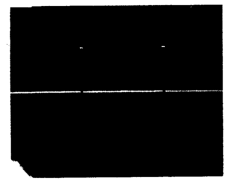

TP7
2V/50μsec. div.

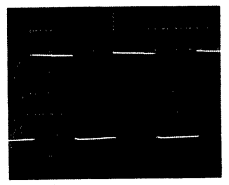

TP15
2V/20μsec. div.

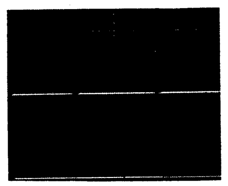

TP104
2V/10msec. div.


TP8
20V/0.1msec. div.

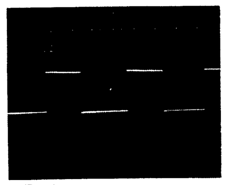

TP16
2V/0.1msec. div.

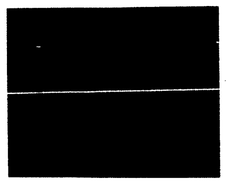

TP105
10V/10msec. div.

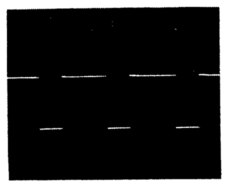

TP10
5V/5msec. div.

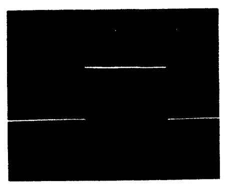

TP21
5V/20msec. div.


TP106
2V/10msec. div.

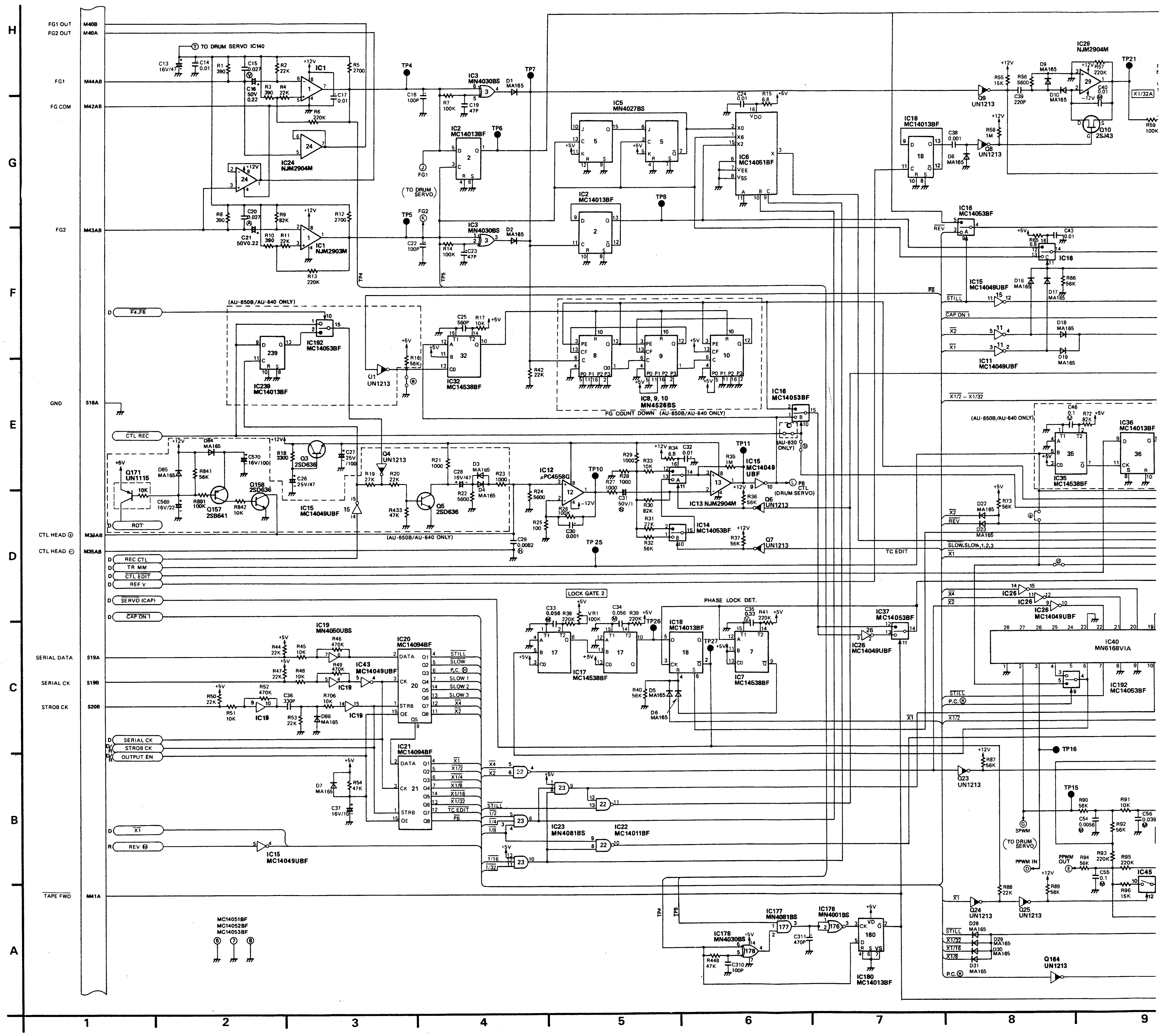

TP11
5V/10msec. div.

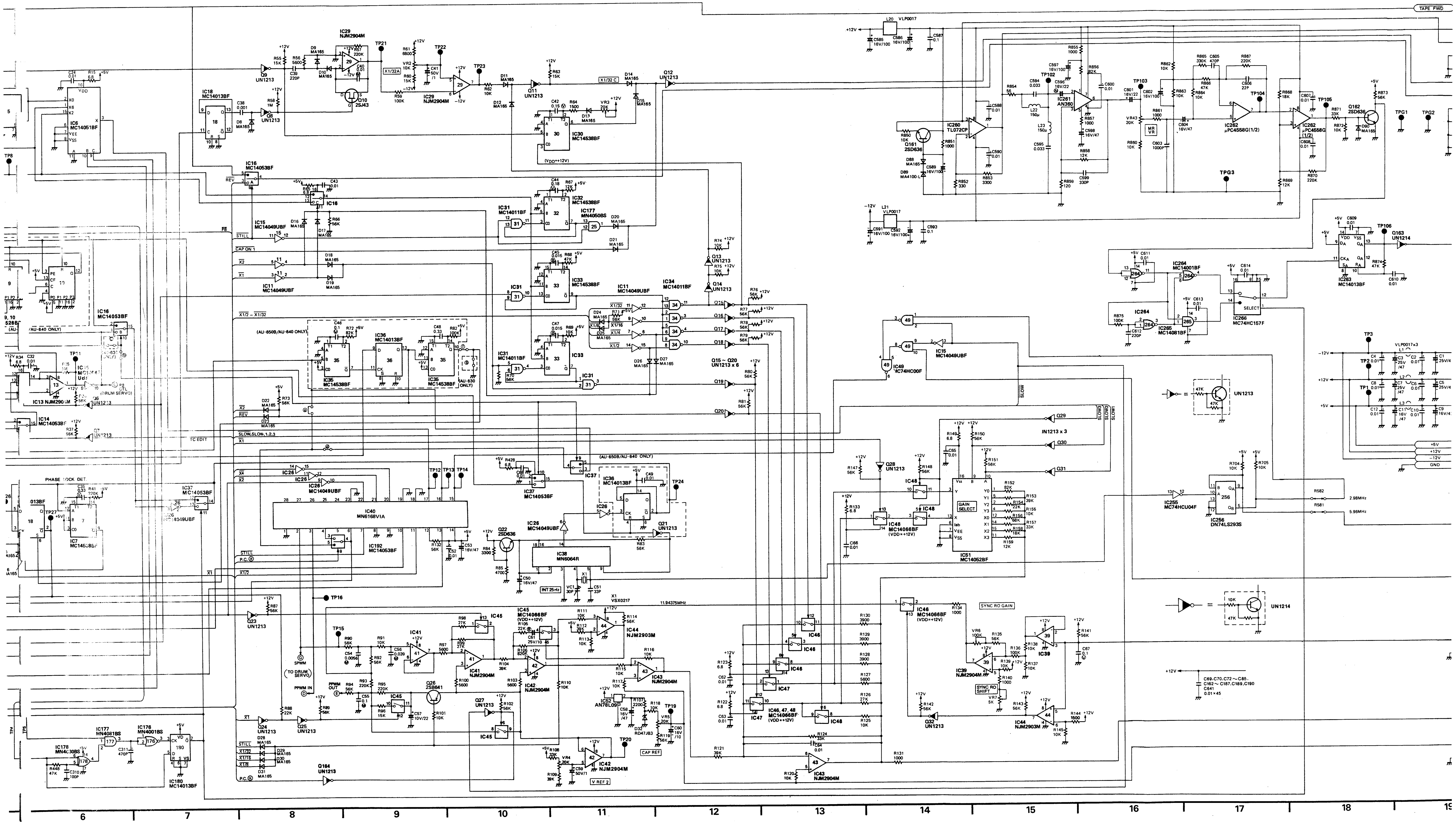

TP23
10V/10msec. div.

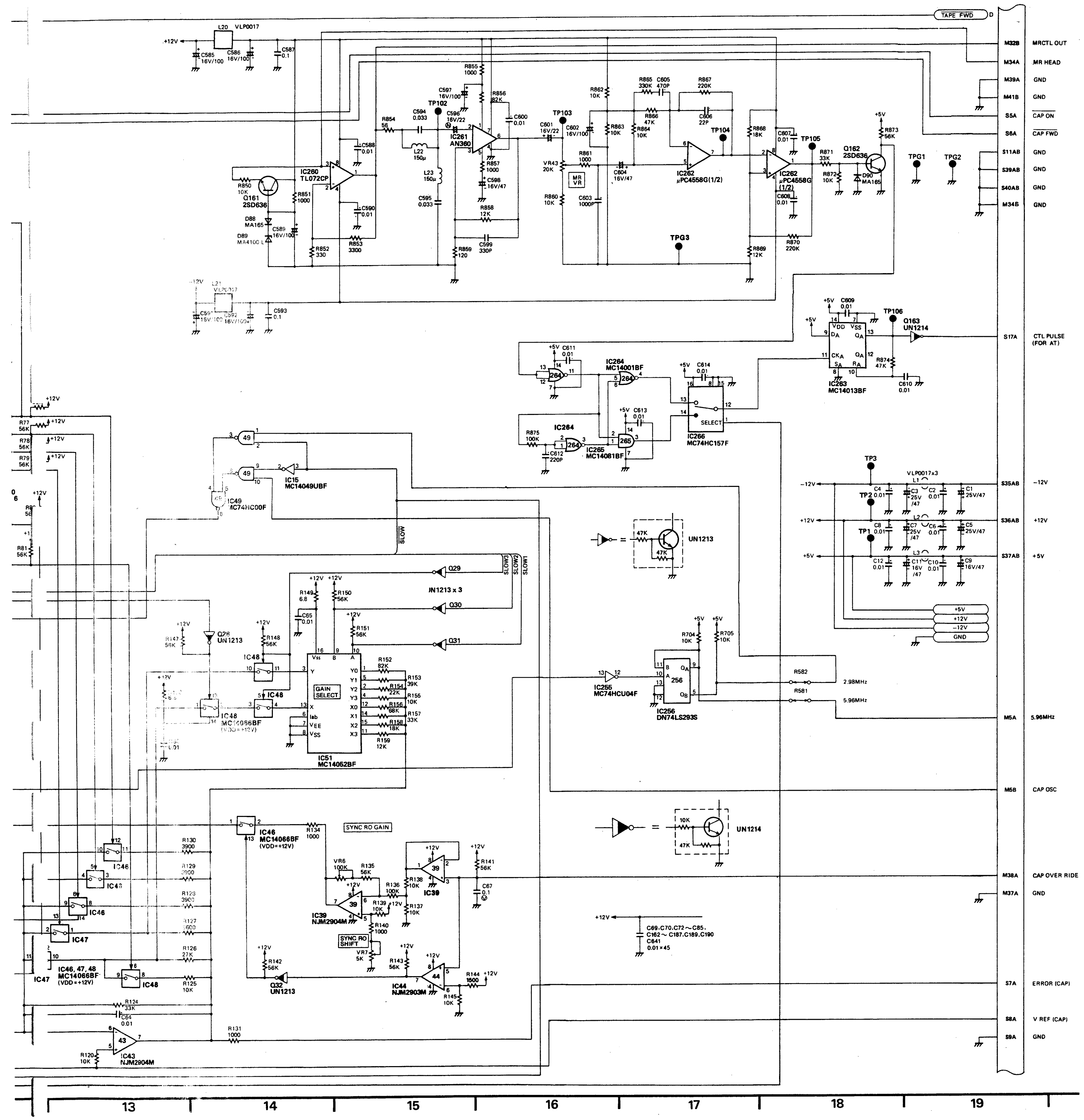

TP12
2V/0.5msec. div.


TP24
2V/5msec. div.

L5 CAPSTAN SERVO SCHEMATIC DIAGRAM




TAPE FWD
IC29 NJM2904M
IC18 MC14013BF
IC6 MC14051BF
IC16 MC14053BF
IC30 MC14538BF
IC31 MC14011BF
IC32 MC14538BF
IC177 MN4050BS
IC33 MC14538BF
IC34 MC14011BF
IC11 MC14049UBF
IC15 MC14049UBF
IC35 MC14538BF
IC36 MC14013BF
IC37 MC14053BF
IC40 MN6168VIA
IC192 MC14053BF
IC38 MN6064R
IC26 MC14049UBF
IC41 NJM2904M
IC42 NJM2904M
IC43 NJM2904M
IC44 NJM2903M
IC45 MC14066BF
IC46, 47, 48 MC14066BF
IC49 MC74HC00F
IC51 MC14052BF
IC39 NJM2904M
IC260 TL072CP
IC261 AN360
IC262 μPC4558G(1/2)
IC263 MC14013BF
IC264 MC14001BF
IC265 MC14081BF
IC266 MC74HC157F
IC255 MC74HCU04F
IC256 DN74LS293S
IC178 MN4C30BS
IC176 MN4001BS
IC180 MC14013BF
IC13 NJM2904M
IC14 MC14053BF
IC7 MC14538BF
Q15 ~ Q20 UN1213 x 6
IN1213 x 3
UN1213
UN1214
GAIN SELECT
SYNC RO GAIN
SYNC RO SHIFT
PHASE LOCK DET
(TO DRUM SERVO)
INT 25Hz
CAP REF
V REF 2
X1 VSX0217
11.94375MHz
2.98MHz
5.96MHz
(AU-650B/AU-640 ONLY)
(AU-630 ONLY)
+5V
+12V
-12V
GND
TP21 TP22 TP23 TP12 TP13 TP14 TP15 TP16 TP19 TP20 TP24 TP102 TP103 TP104 TP105 TP106 TP3 TP1 TP2 TPG1 TPG2 TPG3
6
7
8
9
10
11
12
13
14
15
16
17
18
19



L-5M		SERVO & REEL			
B		NO	A		
	-	1	GND		
	-	2	GND		
	-	3	+5V	POWER2-7	
L3M-4A, 5A	-	4	-12V		
L6M-43B	CAP OSC	5	5.96MHz	L6M-43A	
		6			
		7			
	-	8	GND		
		9	Y R/P H SW	L6S-21B	
		10			
P14-2		11	GND	P14-6	
L2M-40A	P14-1 Y H SW	12	AT REF H SW	P14-5	
P14-3	C H SW	13			
P14-4	GND	14			
	GND	15			
		16			
		17			
L3S-9A	EE	18			
P27-5	GND	19			
		20			
	-	21	PG	P10-1	
	-	22	(GND)	P10-2	
	-	23	FG	P10-3	
	-	24	(GND)	P10-4	
		25	TIMER OUT	P23-7	P19-4
	-	26	+B	P10-5	
		27			
		28			
L2M-35B	GND	29	PB SYNC	L2M-35A	L6M-19B
L1M-36B	GND	30	25Hz	L1M-35B	
L2M-31B	GND	31	PB FRAMING (1)	L2M-31A	
P28-1	WR CTL OUT	32	DRUM LOCK	L6M-41A	
L3S-10A	L6M46B SERVO LOCK	33	DRUM SERVO	P35-1	
	CN11-2 (GND)	34	MR HEAD	CN11-1	
	-	35	CTL HEAD ⊖	CN12-2	
	-	36	CTL HEAD ⊕	CN12-1	
P23-9	TR VR ⊕	37	GND	L6S-32A	
P23-10	TR VR ⊖	38	CAP OVERRIDE	L6S-31A	
	-	39	GND	P22-2	
P22-1	FG1 OUT	40	FG 2 OUT	P22-6	
P22-3	GND	41	TAPE FWD	L6S-16A	
	-	42	FG COM	P30-1	
	-	43	FG2	P30-2	
	-	44	FG1	P30-3	
P39-1	PCM H SW	45	FIELD SELECT 1	L6S-6B	
P39-2	PCM GATE	46	FIELD SELECT 2	L6S-7B	
L6S-22B	PCM ERASE	47	FIELD SELECT 3	L6S-10B	
L3M-45A, 46A	-	48	+12V		
	-	49	GND		
	-	50	GND		

L-5S		SERVO & REEL			
B		NO	A		
P43-1	REEL ON Ⓗ	1	CYL ON	P42-1	
P43-2	S DRIVE CONT	2	V REF (DRUM)	P42-2	
P43-3	GND	3	ERROR (DRUM)	P42-3	
P43-4	T DRIVE CONT	4	GND	P42-4	
P43-5	GND	5	CAP ON	P42-5	
P43-6	S BRAKE Ⓗ	6	CAP FWD	P42-6	
P43-7	T BRAKE Ⓗ	7	ERROR (CAP)	P42-7	
P43-8	L CASSET	8	V REF (CAP)	P42-8	
		9	GND	P42-9	
		10			
	GND	11	GND		
		12			
		13			
		14			
		15	REF CF	L1S-3A	
L6S-3B	CF LOCK Ⓛ	16	GND	L6M-50A	
L6S-4B	CF MODE Ⓛ	17	CTL PULSE	L6M-49A	
L6S-25A	4F Ⓛ	18	AUTO/FORCED	L6S-1A	
P5-2	L6S47A SERIAL CK	19	SERIAL DATA (C)	L6S-17B	
P5-3	L6S48A STRB CK	20	SERIAL DATA (R)	L6S-18B	
		21	SERIAL DATA (T)	L6S-16B	
L6S-13B	REF 25/2Hz	22	REF 25/4Hz	L6S-13A	
L6S-14A	TR FG 1	23	TR FG 2	L6S-15A	
L6M-46A	TAPE SLACK	24			
P13-1	TR PH 1	25	TR PH 2	P13-2	
P13-3	S TENSION Va	26	T TENSION Va	P13-6	
P13-4	S TENSION	27	T TENSION	P13-7	
P13-5	S TENSION GND	28	T TENSION GND	P13-8	
		29			
P35-3	L3M36A REV SEARCH Ⓗ	30	FWD SEARCH Ⓗ	P35-2	
		31			
		32			
	-	33	GND		
		34			
	-	35	-12V	POWER2-1	L6S-37
	-	36	+12V	L6S-38	
	-	37	+5V	POWER2-7	
	-	38	+5V		
	-	39	GND		
	-	40	GND		

To FRONT

P5			
L6S-19B	1	SERIAL DATA FRT	P114-6
L5S-19B	2	SERIAL CK	P114-8
L5S-20B	3	STROB CK	P114-7
L6M-10A	4	AUTO OFF	P113-1
L6M-9A	5	EJECT SW	P112-1
L6M-11A	6	EJECT LAMP	P112-2
L6M-9B	7	REM 1 LED Ⓛ	P103-1
L6M-10B	8	REM 2 LED Ⓛ	P103-2

TO CHASSIS INTERMEDIATE

P10			
L5M-21	1	PG	P461-1
L5M-22	2	(GND)	P461-2
L5M-23	3	FG	P461-3
L5M-24	4	(GND)	P461-4
L5M-26A	5	+B	P461-5

To CHASSIS INTERMEDIATE

P13			
L5S-25B	1	TR PH 1	P456-1
L5S-25A	2	TR PH 2	P456-2
L5S-26B	3	STENSION Va	P456-3
L5S-27B	4	S TENSION	P456-4
L5S-28B	5	S TENSION END	P456-5
L5S-26A	6	T TENSION Va	P456-6
L5S-27A	7	T TENSION	P456-7
L5S-28A	8	T TENSION GND	P456-8

To SØ

P14			
L5M-12B	1	Y H SW	P62-1
L5M-11B	2	GND	P62-2
L5M-13B	3	C H SW	P62-3
L5M-14B	4	GND	P62-4
L5M-12A	5	AT REF H SW	P64-6
L5M-11A	6	GND	P64-7
	7		
L6S-5A	8	TAPE N-FMT Ⓛ	
	9		
L6M-49B	10	SEARCH Ⓗ	P62-7
L6M-48B	11	FM ATT Ⓛ	P62-6
L6S-19A	12	FM MUT Ⓛ	P62-5

To FRONT PANEL

P19			
L6M-44B	1	TAPE STOP Ⓗ	P48-1
	2	TIMER GND	P48-2
	3	+12V	P48-3
L5M-25A	4	TIMER OUT	P48-4

OPTION (HOUR METER SUB)

To S0

P22			
L5M-40B	1	FG1 OUT	P64-3
L5M-40A	2	FG2 OUT	P64-4
L5M-41B	3	GND	P64-5

To FRONT

P23			
	1	+5V	P113-2
	2	+5V	P112-3
	3	+5V	P103-4
	4	+12V	P151-1
	5	+12V	P134-6
	6	-12V	P134-8
L5M-25A	7	TIMER OUT	P105-1
	8	TIMER GND	P105-3
L5M-37B	9	TR VR ⊕	P116-1
L5M-38B	10	TR VR ⊖	P116-2

To SØ

P27			
L6M25A	1	GND	P75-1
L6M25B	2	TC PB	P75-2
L6M17A	3	GND	P75-3

To SØ

P28			
L5M32B	1	MR CTL OUT	P64-1
—	2		P64-2
—	3	—	—

TO CAPSTAN MOTOR

P30			
L5M-42	1	FG COM	P07-2
L5M-43	2	FG2	P07-3
L5M-44	3	FG1	P07-1

To S0

P35			
L5M-33A	1	DRUM SERVO	P77-5
L5S-30A	2	FWD SEARCH Ⓗ	P78-1
L5S-30B	3	REV SEARCH Ⓗ	P78-2
	4		
L6M-31A	5	SHUTTLE Ⓗ	P78-3
L6S-30B	6	T BRK SOL	P78-6
L6S-1B	7	ATT1	P76-1
L6S-2B	8	ATT2	P76-2
L6S-7A	9	LOADING MUT Ⓛ	P78-4
L6M-35B	10	FAN STOP Ⓛ	P78-7

P39			
L5M45B	1	PCM H SW	
L5M46B	2	PCM GATE	
	3	GND	
L6S21A	4	PCM EE1	
L6S22A	5	PCM EE2	
L6S23A	6	STBY Ⓛ	
L6S24A	7	PLAY Ⓛ	
L6M30A	8	R/P HEAD	
L6M29B	9	TAPE R/P	
L1S-10A	10	HD	
	11	GND	
L6S-25B	12	POWER ON Ⓛ	

To JACK
(PCM ONLY)

TO SERVO DRIVE

P42			
L5S-1A	1	DRUM ON	P409-1
L5S-2A	2	V REF (DRUM)	P409-2
L5S-3A	3	ERROR (DRUM)	P409-3
L5S-4A	4	GND	P409-4
L5S-5A	5	CAP ON	P409-5
L5S-6A	6	CAP FWD	P409-6
L5S-7A	7	ERROR (CAP)	P409-7
L5S-8A	8	V REF (CAP)	P409-8
L5S-9A	9	GND	P409-9
—	10	—	—

TO SERVO DRIVE

P43			
L5S-1B	1	REEL ON Ⓗ	P415-1
L5S-2B	2	S DRIVE CONT	P415-2
L5S-3B	3	GND	P415-3
L5S-4B	4	T DRIVE CONT	P415-4
L5S-5B	5	GND	P415-5
L5S-6B	6	S BRAKE Ⓗ	P415-6
L5S-7B	7	T BRAKE Ⓗ	P415-7
L5S-8B	8	L CASSET	P415-8
	9	+12V	P415-9
	10	GND	P415-10
	11	+24V	P415-11
P32-8, 9	12	UNREG GND	P415-12

To SØ

POWER 2			
L5S-35A	1	-12V	POWER5-1
L3S-13A	2	-5V	POWER5-2
—	3	GND	POWER5-3
—	4	GND	POWER5-4
—	5	+12V Ⓛ	POWER5-5
—	6		POWER5-6
POWER1 1.2 L5M-3A L5S-37A	7	+5V	POWER5-7

To A/C HEAD

CN11		
L5M-34A	1	MR HEAD
L5M-34B	2	(GND)

To A/C HEAD

CN12		
L5M-36	1	CTL H ⊕
L5M-35	2	CTL H ⊖

REVERSE SIDE

L5 REEL SERVO
SCHEMATIC DIAGRAM

L-5M		SERVO & REEL			
B		NO	A		
	–	1	GND		
	–	2	GND		
	–	3	+5V	POWER2–7	
L3M-4A, 5A	–	4	-12V		
L6M-43B	CAP OSC	5	5.96MHz	L6M-43A	
		6			
		7			
	–	8	GND		
		9	Y R/P H SW	L6S-21B	
		10			
P14-2	–	11	GND	P14-6	
L2M-40A P14-1	Y H SW	12	AT REF H SW	P14–5	
P14-3	C H SW	13			
P14-4	GND	14			
	GND	15			
		16			
		17			
L3S-9A	E-E	18			
P27-5	GND	19			
		20			
	–	21	PG	P10–1	
	–	22	(GND)	P10–2	
	–	23	FG	P10–3	
	–	24	(GND)	P10–4	
		25	TIMER OUT	P23-7	P19-4
		26	+8	P10–5	
		27			
		28			
L2M-35B	GND	29	PB SYNC	L2M-35A	L6M-19B
L1M-36B	GND	30	25Hz	L1M-35B	
L2M-31B	GND	31	PB FRAMING (1)	L2M-31A	
P28–1	WR CTL OUT	32	DRUM LOCK	L6M-41A	
L3S-10A L6M46B	SERVO LOCK	33	DRUM SERVO	P35-1	
CN11–2	(GND)	34	MR HEAD	CN11-1	
	–	35	CTL HEAD ⊖	CN12–2	
	–	36	CTL HEAD ⊕	CN12-1	
P23–9	TR VR ⊕	37	GND	L6S-32A	
P23–10	TR VR ⊖	38	CAP OVERRIDE	L6S-31A	
	–	39	GND	P22-2	
P22-1	FG1 OUT	40	FG 2 OUT	P22–6	
P22-3	GND	41	TAPE FWD	L6S-16A	
	–	42	FG COM	P30–1	
	–	43	FG 2	P30–2	
	–	44	FG 1	P30–3	
P39–1	PCM H SW	45	FIELD SELECT 1	L6S-6B	
P39–2	PCM GATE	46	FIELD SELECT 2	L6S-7B	
L6S-22B	PCM ERASE	47	FIELD SELECT 3	L6S-10B	
L3M-45A,46A	–	48	+12V		
	–	49	GND		
	–	50	GND		

L-5S		SERVO & REEL			
B		NO	A		
P43–1	REEL ON Ⓜ	1	CYL ON	P42–1	
P43–2	S DRIVE CONT	2	V REF (DRUM)	P42–2	
P43–3	GND	3	ERROR (DRUM)	P42–3	
P43–4	T DRIVE CONT	4	GND	P42–4	
P43–5	GND	5	CAP ON	P42–5	
P43–6	S BRAKE Ⓗ	6	CAP FWD	P42–6	
P43–7	T BRAKE Ⓗ	7	ERROR (CAP)	P42–7	
P43–8	L CASSET	8	V REF (CAP)	P42–8	
		9	GND	P42–9	
		10			
	GND	11	GND		
		12			
		13			
		14			
		15	REF CF	L1S-3A	
L6S-3B	CF LOCK Ⓛ	16	GND	L6M-50A	
L6S-4B	CF MODE Ⓛ	17	CTL PULSE	L6M-49A	
L6S-25A	4F Ⓛ	18	AUTO/FORCED	L6S-1A	
P5–2 L6S-17A	SERIAL CK	19	SERIAL DATA (C)	L6S-17B	
P5–3 L6S-18A	STRB CK	20	SERIAL DATA (R)	L6S-18B	
		21	SERIAL DATA (T)	L6S-16B	
L6S-13B	REF 25/2Hz	22	REF 25/4Hz	L6S-13A	
L6S-14A	TR FG 1	23	TR FG 2	L6S-15A	
L6M-46A	TAPE SLACK	24			
P13–1	TR PH 1	25	TR PH 2	P13–2	
P13–3	S TENSION Va	26	T TENSION Va	P13–6	
P13–4	S TENSION	27	T TENSION	P13–7	
P13–5	S TENSION GND	28	T TENSION GND	P13–8	
		29			
P35-3 L3M36A	REV SEARCH Ⓗ	30	FWD SEARCH Ⓗ	P35–2	
		31			
		32			
	–	33	GND		
		34			
	–	35	–12V	POWER2–1	L6S-37
	–	36	+12V	L6S-38	
	–	37	+5V	POWER2-7	
	–	38	+5V		
	–	39	GND		
	–	40	GND		

To FRONT

P5			
L6S-19B	1	SERIAL DATA FRT	P114-6
L5S-19B	2	SERIAL CK	P114-8
L5S-20B	3	STROB CK	P114-7
L6M-10A	4	AUTO OFF	P113-1
L6M-9A	5	EJECT SW	P112-1
L6M-11A	6	EJECT LAMP	P112-2
L6M-9B	7	REM 1 LED Ⓛ	P103-1
L6M-10B	8	REM 2 LED Ⓛ	P103-2

TO CHASSIS INTERMEDIATE

P10			
L5M-21	1	PG	P461-1
L5M-22	2	(GND)	P461-2
L5M-23	3	FG	P461-3
L5M-24	4	(GND)	P461-4
L5M-26A	5	+8	P461-5

To CHASSIS INTERMEDIATE

P13			
L5S-25B	1	TR PH 1	P456-1
L5S-25A	2	TR PH 2	P456-2
L5S-26B	3	S TENSION Va	P456-3
L5S-27B	4	S TENSION	P456-4
L5S-28B	5	S TENSION END	P456-5
L5S-26A	6	T TENSION Va	P456-6
L5S-27A	7	T TENSION	P456-7
L5S-28A	8	T TENSION GND	P456-8

To S0

P14			
L5M-12B	1	Y H SW	P62-1
L5M-11B	2	GND	P62-2
L5M-13B	3	C H SW	P62-3
L5M-14B	4	GND	P62-4
L5M-12A	5	AT REF H SW	P64-6
L5M-11A	6	GND	P64-7
	7		
L6S-5A	8	TAPE N-FMT Ⓛ	
	9		
L6M-49B	10	SEARCH Ⓗ	P62-7
L6M-48B	11	FM ATT Ⓗ	P62-6
L6S-19A	12	FM MUT Ⓛ	P62-5

To FRONT PANEL

P19			
L6M-44B	1	TAPE STOP Ⓗ	P48-1
	2	TIMER GND	P48-2
	3	+12V	P48-3
L5M-25A	4	TIMER OUT	P48-4

OPTION (HOUR METER SUB)

To S0

P22			
L5M-40B	1	FG1 OUT	P64-3
L5M-40A	2	FG2 OUT	P64-4
L5M-41B	3	GND	P64-5

To FRONT

P23			
	1	+5V	P113-2
	2	+5V	P112-3
	3	+5V	P103-4
	4	+12V	P151-1
	5	+12V	P134-6
	6	–12V	P134-8
L5M-25A	7	TIMER OUT	P105-1
	8	TIMER GND	P105-3
L5M-37B	9	TR VR ⊕	P116-1
L5M-38B	10	TR VR ⊖	P116-2

To S0

P27			
L6M25A	1	GND	P75-1
L6M25B	2	TC PB	P75-2
L6M17A	3	GND	P75-3

To S0

P28			
L5M32B	1	MR CTL OUT	P64-1
—	2		P64-2
—	3	—	—

TO CAPSTAN MOTOR

P30			
L5M-42	1	FG COM	P07-2
L5M-43	2	FG2	P07-3
L5M-44	3	FG1	P07-1

To S0

P35			
L5M-33A	1	DRUM SERVO	P77-5
L5S-30A	2	FWD SEARCH Ⓗ	P78-1
L5S-30B	3	REV SEARCH Ⓗ	P78-2
	4		
L6M-31A	5	SHUTTLE Ⓗ	P78-3
L6S-30B	6	T BRK SOL	P78-6
L6S-1B	7	ATT1	P76-1
L6S-2B	8	ATT2	P76-2
L6S-7A	9	LOADING MUT Ⓛ	P78-4
L6M-35B	10	FAN STOP Ⓛ	P78-7

P39			
L5M-45B	1	PCM H SW	
L5M-46B	2	PCM GATE	
	3	GND	
L6S-21A	4	PCM EE1	
L6S-22A	5	PCM EE2	
L6S-23A	6	STBY Ⓛ	
L6S-24A	7	PLAY Ⓛ	
L6M-30A	8	R/P HEAD	
L6M-29B	9	TAPE R/P	
L1S-10A	10	HD	
	11	GND	
L6S-25B	12	POWER ON Ⓛ	

To JACK
(PCM ONLY)

TO SERVO DRIVE

P42			
L5S-1A	1	DRUM ON	P409-1
L5S-2A	2	V REF (DRUM)	P409-2
L5S-3A	3	ERROR (DRUM)	P409-3
L5S-4A	4	GND	P409-4
L5S-5A	5	CAP ON	P409-5
L5S-6A	6	CAP FWD	P409-6
L5S-7A	7	ERROR (CAP)	P409-7
L5S-8A	8	V REF (CAP)	P409-8
L5S-9A	9	GND	P409-9
—	10	—	—

TO SERVO DRIVE

P43			
L5S-1B	1	REEL ON Ⓗ	P415-1
L5S-2B	2	S DRIVE CONT	P415-2
L5S-3B	3	GND	P415-3
L5S-4B	4	T DRIVE CONT	P415-4
L5S-5B	5	GND	P415-5
L5S-6B	6	S BRAKE Ⓗ	P415-6
L5S-7B	7	T BRAKE Ⓗ	P415-7
L5S-8B	8	L CASSET	P415-8
	9	+12V	P415-9
	10	GND	P415-10
	11	+24V	P415-11
P32-8, 9	12	UNREG GND	P415-12

To S0

POWER 2			
L5S-35A	1	–12V	POWER5-1
L3S-13A	2	–5V	POWER5-2
—	3	GND	POWER5-3
—	4	GND	POWER5-4
—	5	+12V Ⓛ	POWER5-5
—	6		POWER5-6
POWER1 1.2 L5M-3A L5S-37A	7	+5V	POWER5-7

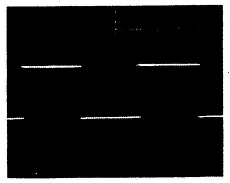
To A/C HEAD

CN11		
L5M-34A	1	MR HEAD
L5M-34B	2	(GND)

To A/C HEAD

CN12		
L5M-36	1	CTL H⊕
L5M-35	2	CTL H⊖

L5 REEL SERVO WAVEFORMS



TP76
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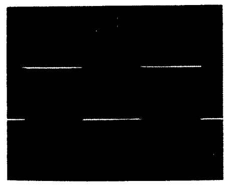
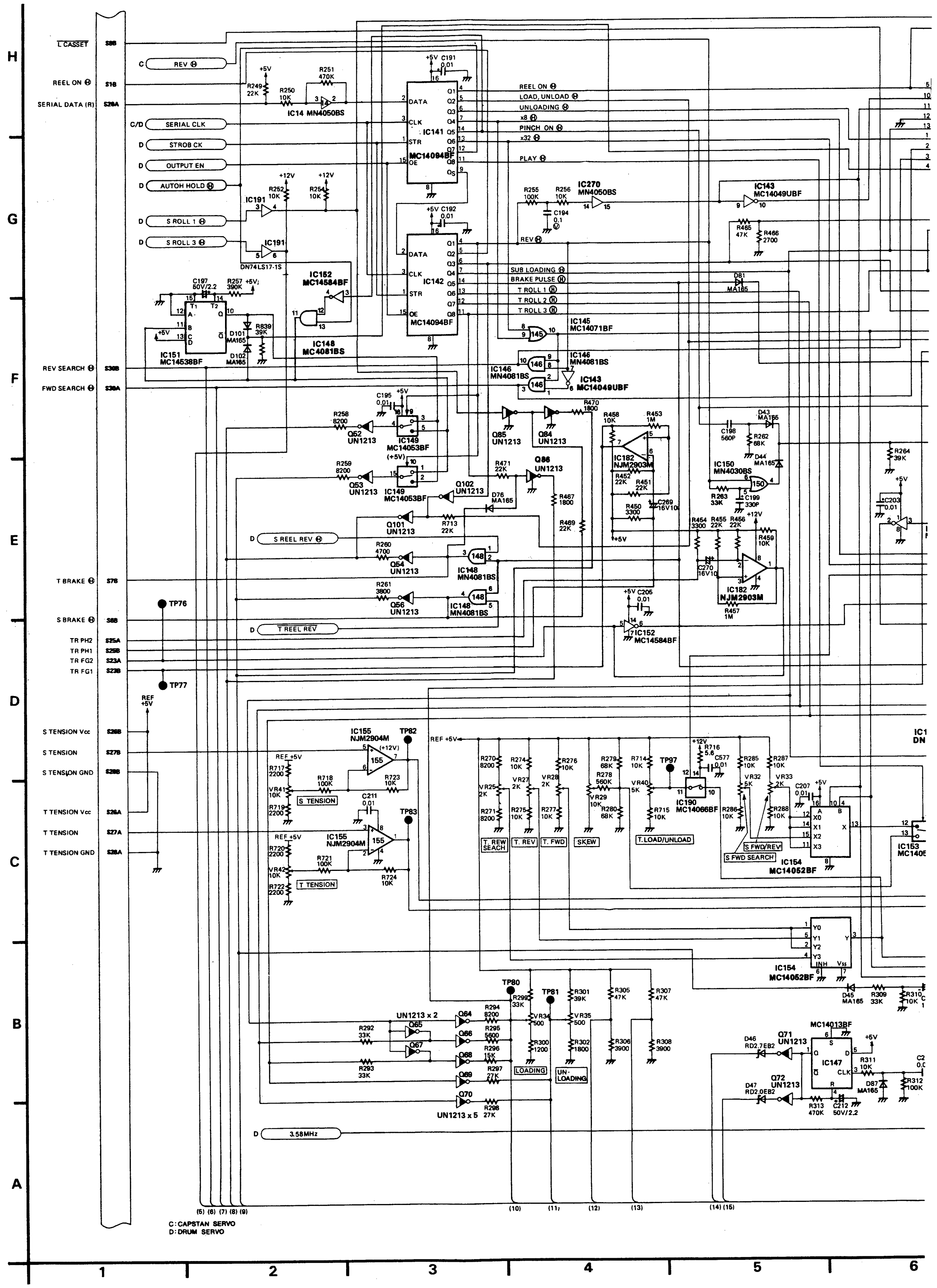
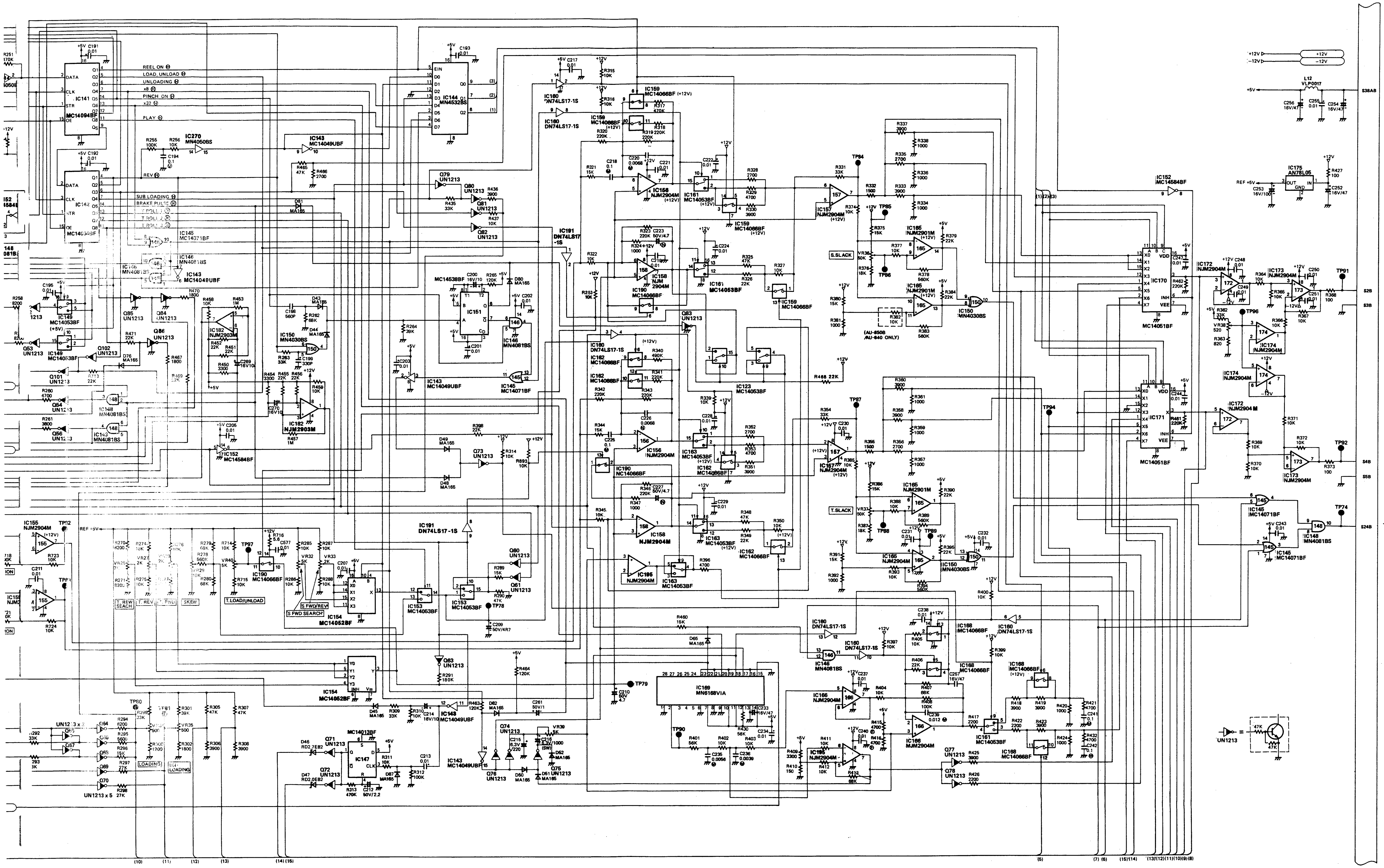


TP77
2V/2msec. div.

L5 REEL SERVO SCHEMATIC DIAGRAM



E MATIC DIAGRAM



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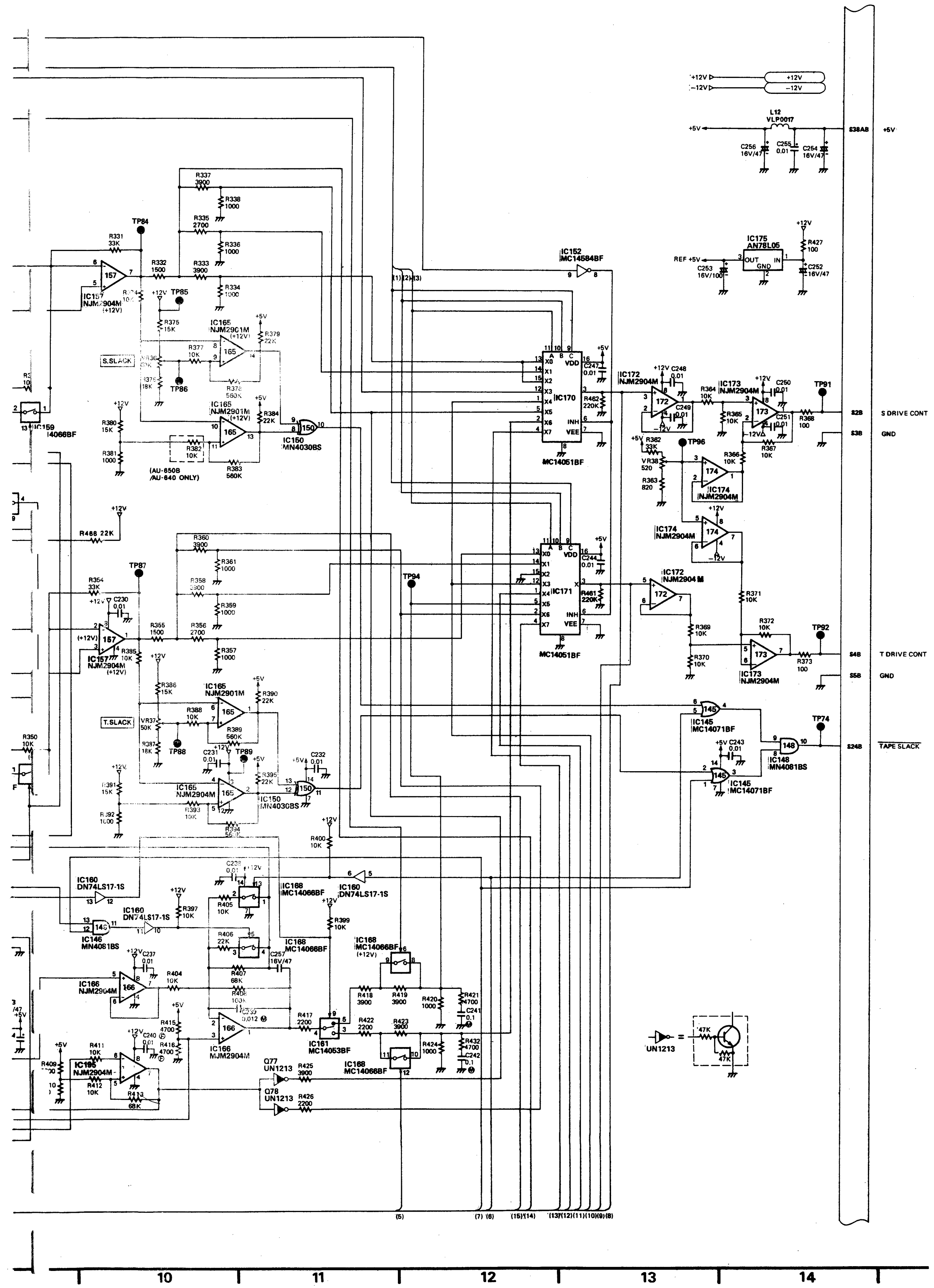


SERVO (L5)

Transistors

Q1	C-7
Q3	B-7
Q4	B-7
Q5	B-7
Q6	B-7
Q7	B-7
Q8	C-5
Q9	C-5
Q10	B-5
Q11	B-4
Q12	B-4
Q13	C-4
Q14	C-4
Q15	C-4
Q16	C-5
Q17	C-5
Q18	C-5
Q19	C-5
Q20	C-5
Q21	C-8
Q22	D-8
Q23	D-6
Q24	D-6
Q25	D-6
Q26	D-5
Q27	D-6
Q28	C-5
Q29	C-4
Q30	C-4
Q31	C-4
Q32	D-6
Q33	B-8
Q34	B-8
Q35	C-11
Q36	E-6
Q37	E-6
Q38	F-6
Q39	B-8
Q40	B-8
Q41	B-8
Q42	B-8
Q49	A-5
Q50	A-8
Q51	A-5
Q52	F-3
Q53	F-3
Q54	F-3
Q56	F-3
Q60	B-2
Q61	B-2
Q63	B-2
Q64	B-2
Q65	C-2
Q66	C-2
Q67	C-2
Q68	C-2
Q69	B-2
Q70	B-2
Q71	C-3
Q72	C-3
Q73	D-3
Q74	E-1
Q75	E-1
Q76	E-1
Q77	E-1
Q78	E-1
Q79	C-2
Q80	C-2
Q81	C-2
Q82	F-3
Q83	F-4
Q84	F-4
Q85	F-3
Q86	F-4
Q87	D-10
Q88	D-8
Q89	D-8
Q90	F-10
Q91	F-9
Q96	B-9
Q97	B-9
Q98	B-9
Q99	B-9
Q100	B-9
Q101	F-3
Q102	F-3
Q140	A-9
Q141	A-9
Q142	A-9
Q143	A-9
Q144	A-9
Q145	A-10
Q146	A-9
Q147	A-9
Q148	A-9
Q149	A-9
Q150	A-10
Q151	A-10
Q152	A-10
Q153	A-10
Q154	A-10
Q155	A-10
Q156	A-9
Q157	B-7
Q158	B-7
Q160	A-7
Q161	F-6
Q162	F-4
Q163	E-4
Q164	D-17
Q171	B-8
Q172	C-10
Q200	B-8

Integrated Circuits

IC1	B-17
IC2	B-5
IC3	B-17
IC5	B-5
IC6	B-17
IC7	B-6
IC8	B-5
IC9	A-17
IC10	A-17
IC11	C-17
IC12	B-15
IC13	B-16
IC14	B-7
IC15	D-14
IC16	C-15
IC17	B-16
IC18	B-17
IC19	C-19
IC20	D-16
IC21	D-16
IC22	D-15
IC23	D-7
IC24	B-6
IC26	D-17
IC29	D-18
IC30	B-4
IC31	C-7
IC32	C-16
IC33	C-15
IC34	C-5
IC35	C-15
IC36	C-15
IC37	C-15
IC38	C-8
IC39	C-17
IC41	D-18
IC42	D-5
IC43	D-18
IC44	D-17
IC45	D-5
IC46	D-18
IC47	D-4
IC48	D-18
IC49	D-14
IC51	C-4
IC52	D-5
IC53	B-15
IC54	E-9
IC55	E-13
IC56	E-10
IC57	E-8
IC58	D-12
IC59	D-12
IC60	D-12
IC61	E-15
IC62	F-13
IC63	E-9
IC64	E-15
IC65	E-7
IC66	E-7
IC67	E-15
IC69	E-7
IC70	E-7
IC71	E-12
IC72	F-9
IC73	F-13
IC74	F-13
IC75	F-9
IC76	F-12
IC77	E-13
IC78	D-10
IC79	F-10
IC80	E-14
IC81	F-15
IC82	F-14
IC83	F-14
IC84	E-14
IC86	F-8
IC87	F-8
IC88	F-9
IC89	F-7
IC90	E-7
IC91	E-7
IC92	E-7
IC93	E-16
IC94	F-16
IC95	F-6
IC96	F-16
IC97	F-7
IC98	E-12
IC99	E-10
IC100	E-12
IC101	E-11
IC102	D-12
IC103	B-8
IC123	B-3
IC132	E-18
IC138	F-6
IC140	B-9
IC141	E-20
IC142	D-2
IC143	D-20
IC144	D-20
IC145	D-20
IC146	F-21
IC147	C-20
IC148	E-20
IC149	E-2
IC150	C-3
IC151	E-20
IC152	E-2
IC153	B-2
IC154	B-21
IC155	A-20
IC156	B-20
IC157	C-20
IC158	B-20
IC159	C-20
IC160	F-21
IC161	B-2
IC162	C-19
IC163	B-3
IC165	C-20
IC166	E-21
IC168	E-21
IC169	F-1
IC170	C-21
IC171	C-21
IC172	D-21
IC173	D-21
IC174	D-21
IC175	B-2
IC176	B-5
IC177	B-17
IC178	B-5
IC180	B-18
IC182	B-19
IC190	B-20
IC191	C-3
IC192	D-18
IC193	C-12
IC194	C-10
IC195	E-1
IC207	D-10
IC208	E-16
IC209	E-6
IC210	E-8
IC211	E-8
IC212	E-15
IC213	B-11
IC214	B-12
IC215	E-14
IC216	E-14
IC217	B-9
IC218	B-13
IC219	B-13
IC220	B-10
IC221	C-13
IC222	B-10
IC223	B-13
IC224	B-14
IC225	B-9
IC226	B-12
IC227	D-10
IC228	E-10
IC229	E-13
IC230	D-12
IC231	B-12
IC232	B-12
IC233	B-12
IC234	B-12
IC235	C-12
IC236	D-13
IC237	E-13
IC238	D-9
IC239	B-16
IC242	C-9
IC244	D-9
IC245	E-9
IC246	E-9
IC247	C-10
IC248	C-13
IC249	C-13
IC250	D-10
IC251	D-9
IC252	D-13
IC255	D-15
IC256	E-15
IC260	F-5
IC261	E-5
IC262	F-18
IC263	E-18
IC264	E-19
IC265	E-4
IC266	E-4
IC267	E-10
IC270	D-2
IC301	C-9
IC302	C-14
IC303	C-14

Test Points

TP1	A-1
TP2	B-1
TP3	B-1
TP4	B-6
TP5	B-6
TP6	B-5
TP7	B-6
TP8	B-5
TP10	B-7
TP11	B-7
TP12	C-6
TP13	E-6
TP14	E-6
TP15	D-5
TP16	D-8
TP19	D-4
TP20	D-5
TP21	B-5
TP22	B-5
TP23	B-5
TP24	C-8
TP25	B-7
TP26	B-6
TP27	B-6
TP31	B-8
TP32	C-11
TP33	C-8
TP34	E-7
TP35	E-6
TP36	E-6
TP37	F-6
TP38	F-6
TP39	E-6
TP40	B-8
TP41	E-10
TP42	E-11
TP43	E-9
TP44	E-11
TP45	C-10
TP46	E-10
TP47	F-10
TP48	F-10
TP49	F-7
TP50	F-7
TP52	A-8
TP54	B-9
TP66	B-10
TP74	B-3
TP76	B-4
TP77	B-4
TP78	B-2
TP79	B-2
TP80	C-1
TP81	C-1
TP82	B-2
TP83	B-3
TP84	C-2
TP85	C-2
TP86	C-2
TP87	C-3
TP88	C-2
TP89	C-2
TP91	D-2
TP92	D-2
TP94	E-2
TP96	D-1
TP97	C-1
TP102	F-5
TP103	F-5
TP104	F-4
TP105	F-4
TP106	E-4
TPG1	A-2
TPG2	A-5
TPG3	E-4

Adjustments

VR1	B-7
VR2	B-5
VR3	C-4
VR5	D-5
VR6	C-5
VR7	C-6
VR8	D-11
VR9	D-11
VR10	F-11
VR11	F-10
VR12	E-6
VR13	E-6
VR14	F-7
VR15	F-6
VR16	E-10
VR17	E-11
VR18	E-11
VR19	B-8
VR20	A-8
VR25	B-1
VR27	B-1
VR28	B-1
VR29	B-1
VR32	B-1
VR33	B-1
VR34	C-1
VR35	B-1
VR36	C-2
VR37	C-3
VR39	E-1
VR40	B-1
VR41	A-2
VR42	A-3
VR43	F-5
VR60	B-8

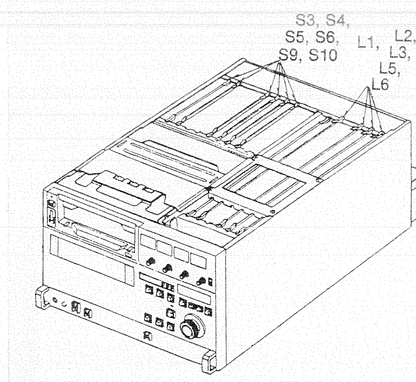
ADDRESS INFORMATION

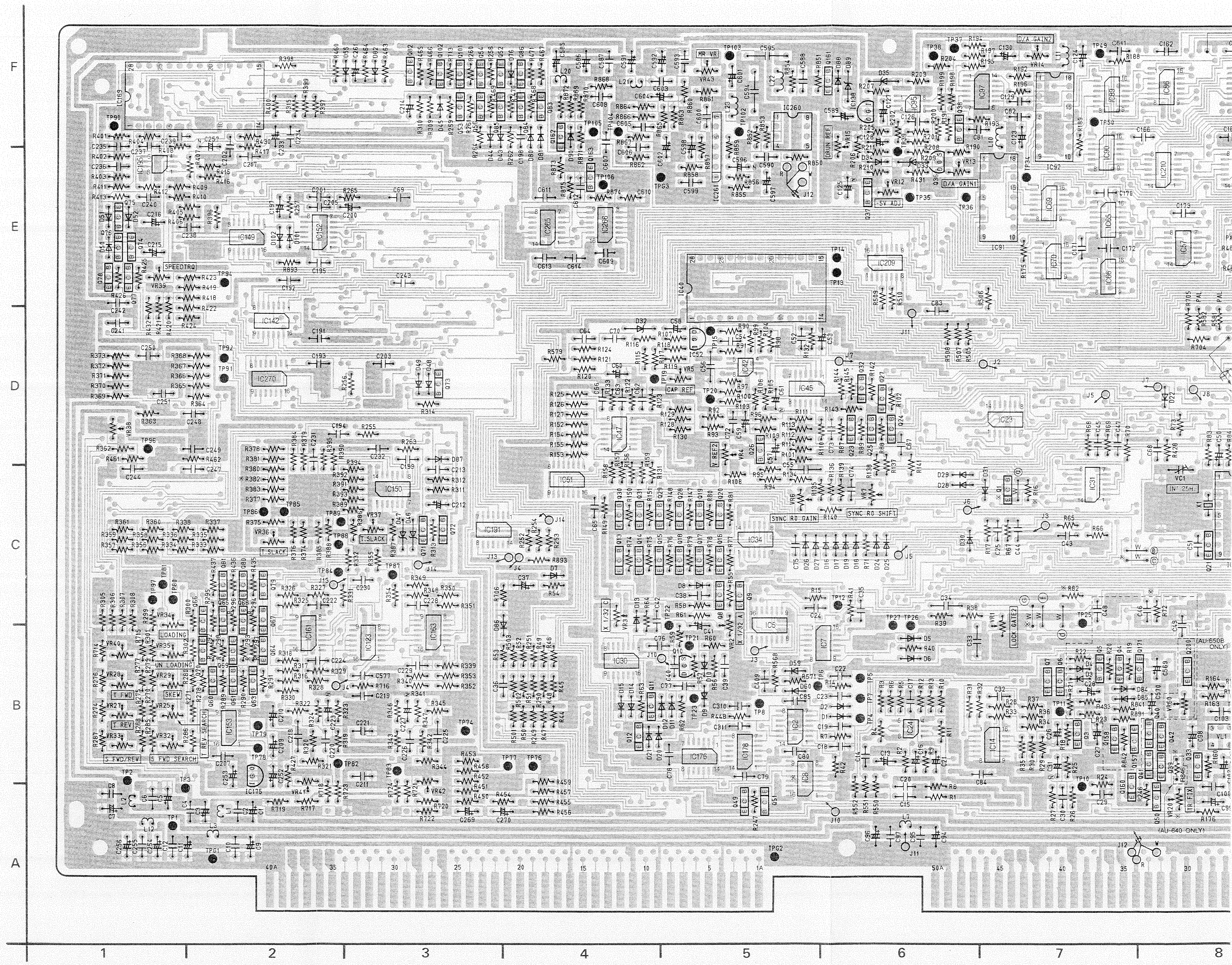
COMPARISON CHART

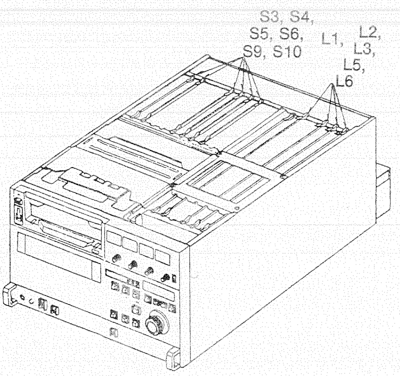
(L5) SERVO P.C.B.					
	AU-650B	AU-630		AU-650B	AU-630
C28	16V47	—	Q142	UN1213	—
C46	0.1	—	Q145	UN1213	—
C48	0.33	—	Q146	UN1213	—
C49	0.01	—	Q147	UN1213	—
C115	0.15	—	Q148	UN1213	—
C119	4700P	—	Q149	UN1213	—
C120	4700P	—	Q150	UN1213	—
C121	0.0068P	—	Q151	UN1213	—
C122	16V220	—	Q152	UN1213	—
C315	0.01	—	Q153	UN1213	—
C350	10V47	—	Q155	UN1213	—
C450	0.001	—	Q157	2SB641	—
C457	2200P	—	Q158	2SD636	—
C458	2200P	—	Q171	UN1115	—
C459	0.12	—	Q172	DTC144EA	—
C460	100P	—	Q200	UN1113	—
C461	0.01	—	R16	56K	—
C462	16V47	—	R19	27K	—
C463	27P	—	R20	22K	—
C464	33P	—	R21	1K	—
C465	0.12	—	R22	5600	—
C466	0.0022	—	R23	1800	—
C467	0.27	—	R72	82K	—
C468	35V4.7	—	R82	100K	—
C569	16V22	—	R183	22K	—
C570	16V100	—	R185	22K	—
D3	MA165	—	R187	1K	—
D4	MA165	—	R382	10K	—
D68	MA165	—	R433	47K	—
D84	MA165	—	R482	100K	—
D85	MA165	—	R577	0	—
IC8	MN4526BS	—	R600	22K	—
IC9	MN4526BS	—	R614	1K	—
IC10	MN4526BS	—	R615	6800	—
IC35	MC14538BF	—	R616	2200	—
IC36	MC14013BF	—	R617	3300	—
IC75	MC74HC74F	—	R618	3300	—
IC76	MN74HC221S	—	R619	33	—
IC80	MC74HC157F	—	R620	560	—
IC81	TC74HC191F	—	R621	110K	—
IC82	TC74HC191F	—	R622	56K	—
IC83	TC74HC191F	—	R623	56K	—
IC217	MC74HC86F	—	R624	56K	—
IC218	MC74HC74F	—	R625	3300	—
IC219	MC74HC08F	—	R626	4700	—
IC220	MC74HC02F	—	R627	10K	—
IC221	NJM2904M	—	R628	110K	—
IC222	MC74HC74F	—	R629	22K	—
IC223	MC14538BF	—	R630	100K	—
IC224	MC14538BF	—	R631	4700	—
IC225	MN6064R	—	R632	10K	—
IC232	MC14053BF	—	R633	4700	—
IC233	MC14053BF	—	R634	4700	—
IC235	MC14538BF	—	R635	10K	—
IC239	MC14013BF	—	R636	27K	—
IC247	MC14011BF	—	R841	56K	—
IC248	MC74HC4020F	—	R842	10K	—
IC303	MC14013BF	MC14053BF	R846	—	0
J21	—	○	R891	100K	—
J22	—	○	SW3	○	—
J23	—	○	TP45	○	—
Q1	UN1213	—	TP47	○	—
Q4	UN1213	—	TP48	○	—
Q5	2SD636	—	TP54	○	—
Q21	UN1213	—	VR10	100K	—
Q96	2SB641	—	VR11	100K	—
Q97	2SB641	—	VR20	20K	50K
Q98	2SD636	—	VR60	50K	—
Q99	2SD636	—	WC	—	○
Q100	DTC144EA	—	WG	—	○
Q140	UN1213	—	X3	VSX0217	—
Q141	UN1213	—			

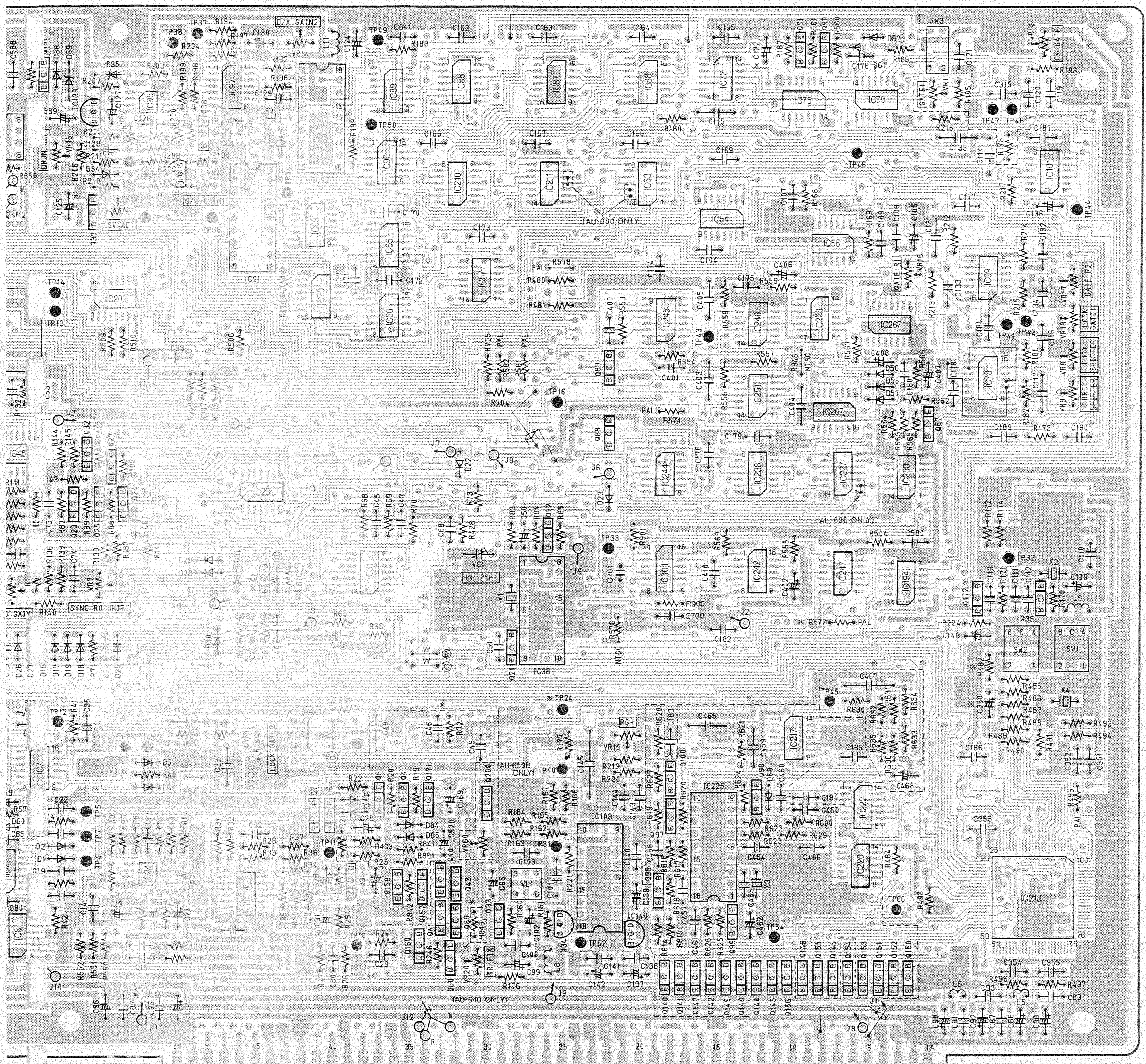
○: PART IS MOUNTED
—: PART IS NOT MOUNTED

L5 SERVO & REEL P.C. BOARD (VEP82046G)









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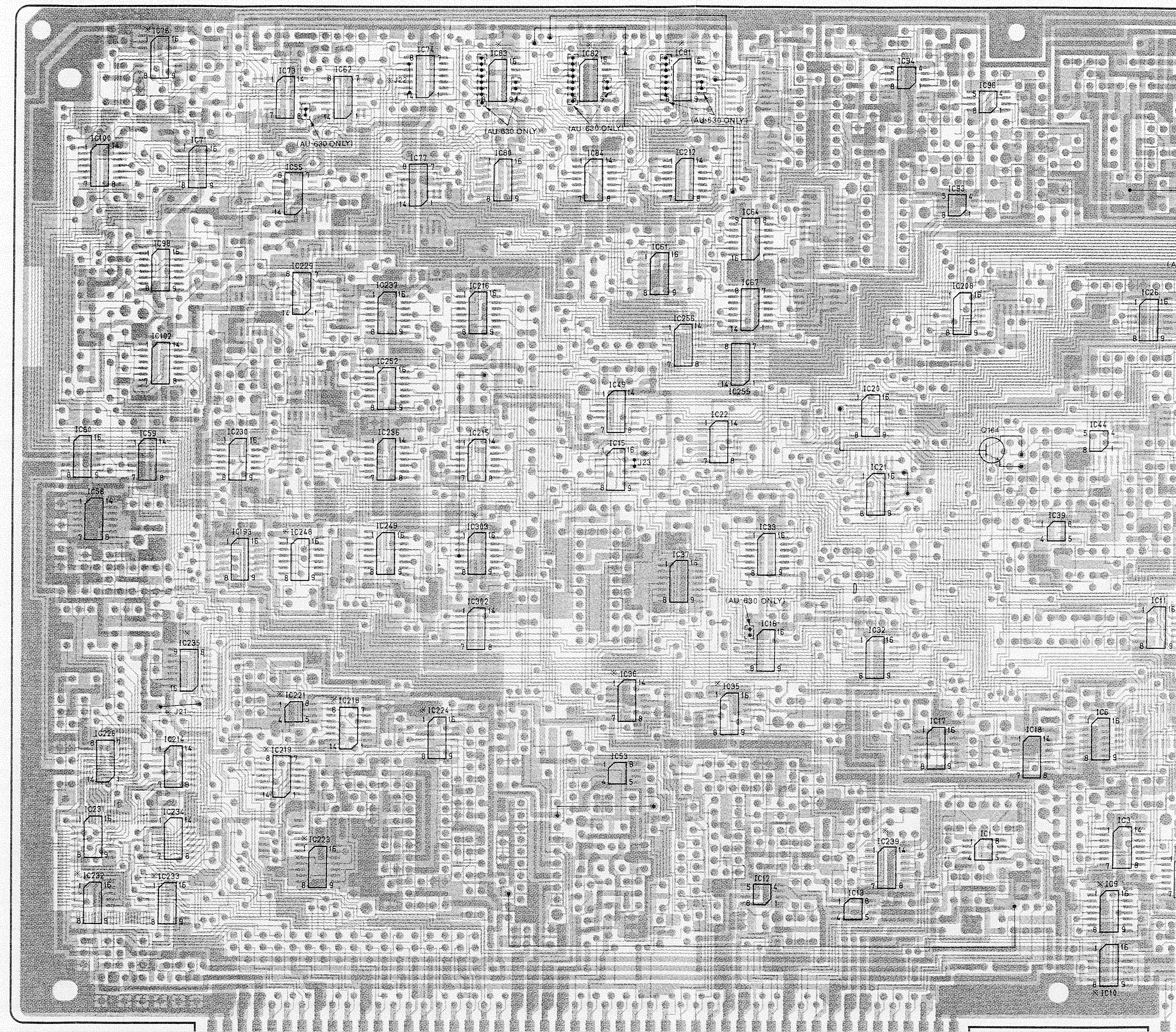
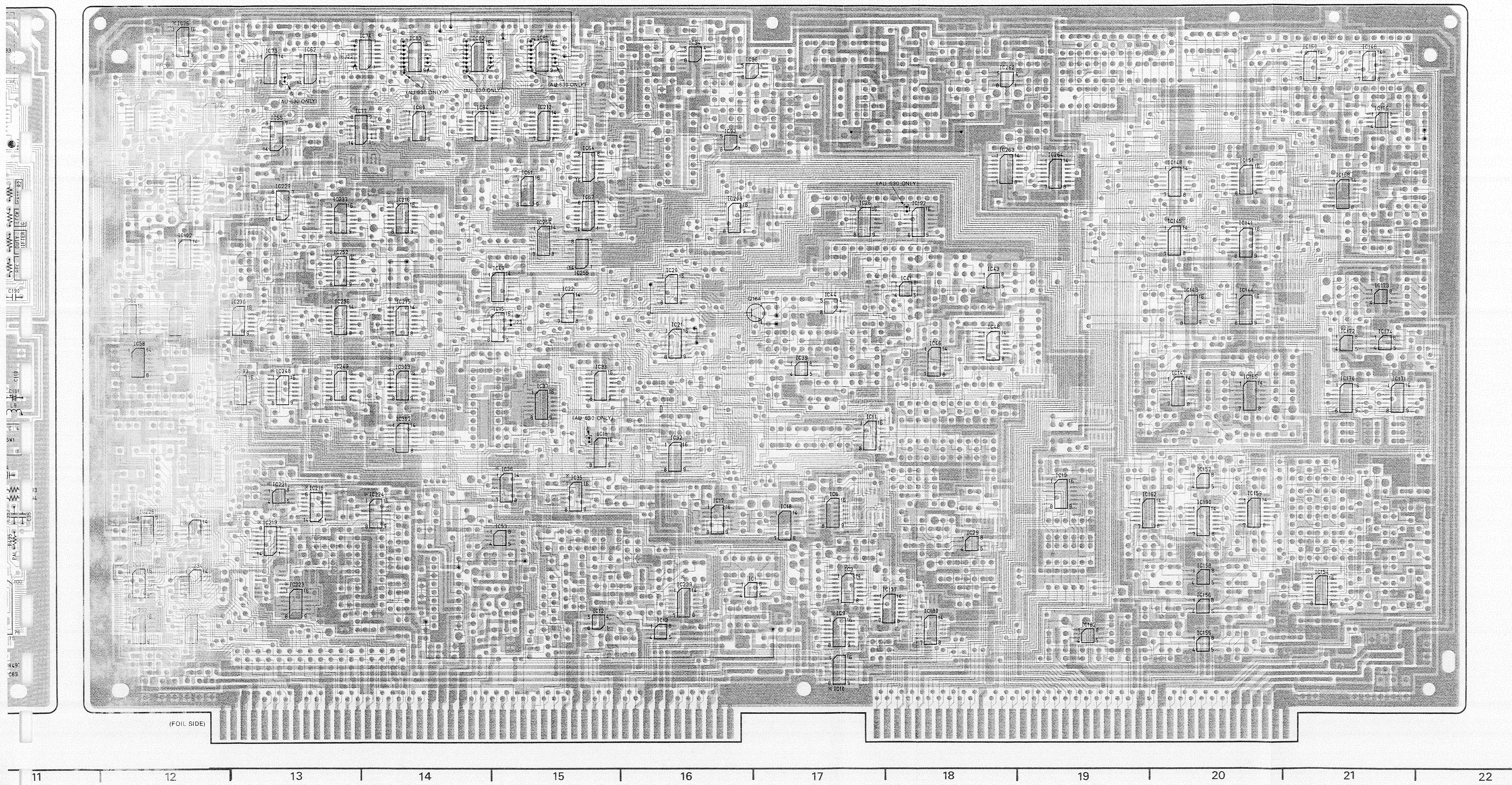


(FOIL SIDE)

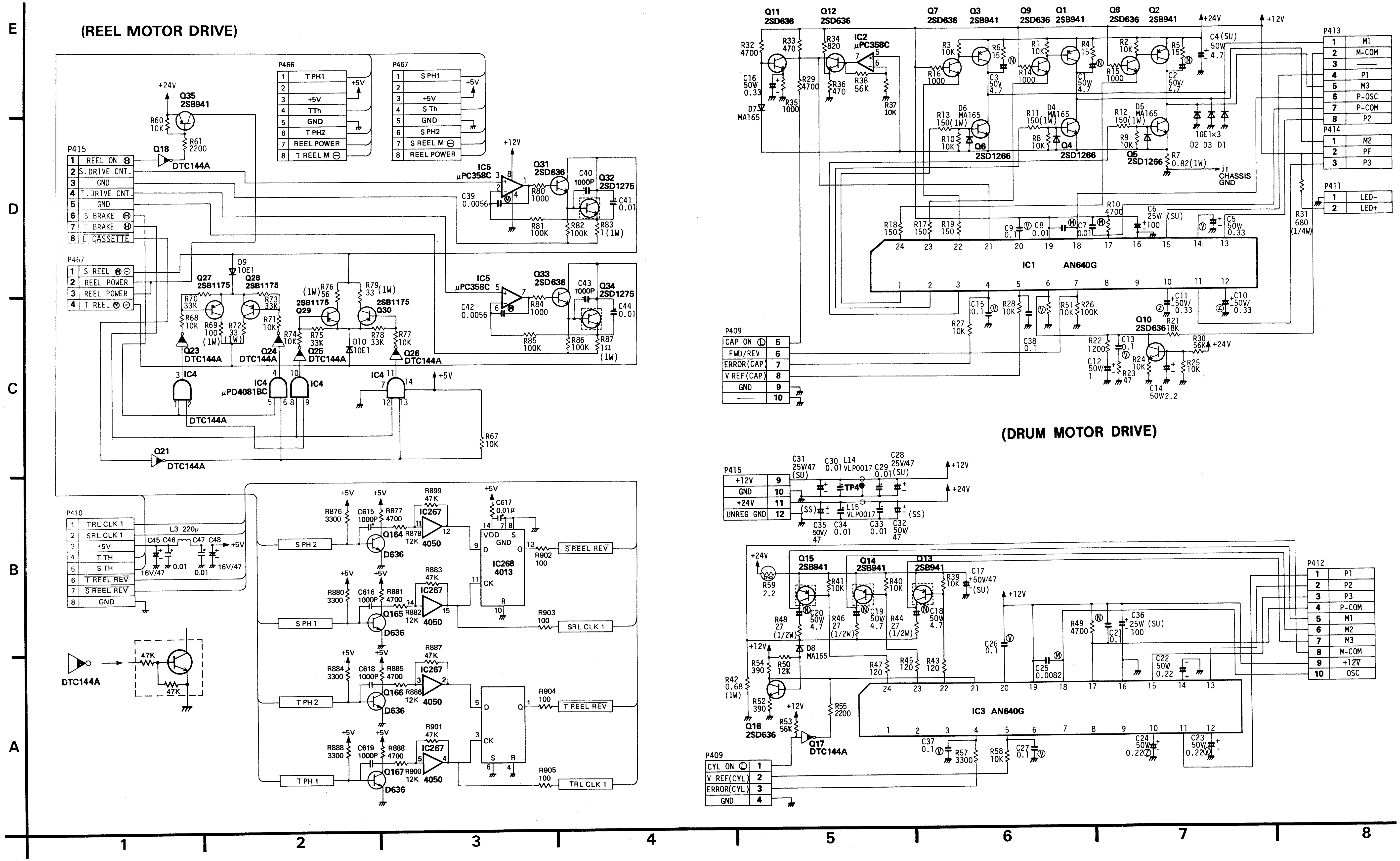
6 7 8 9 10 11 12 13 14 15 16 17

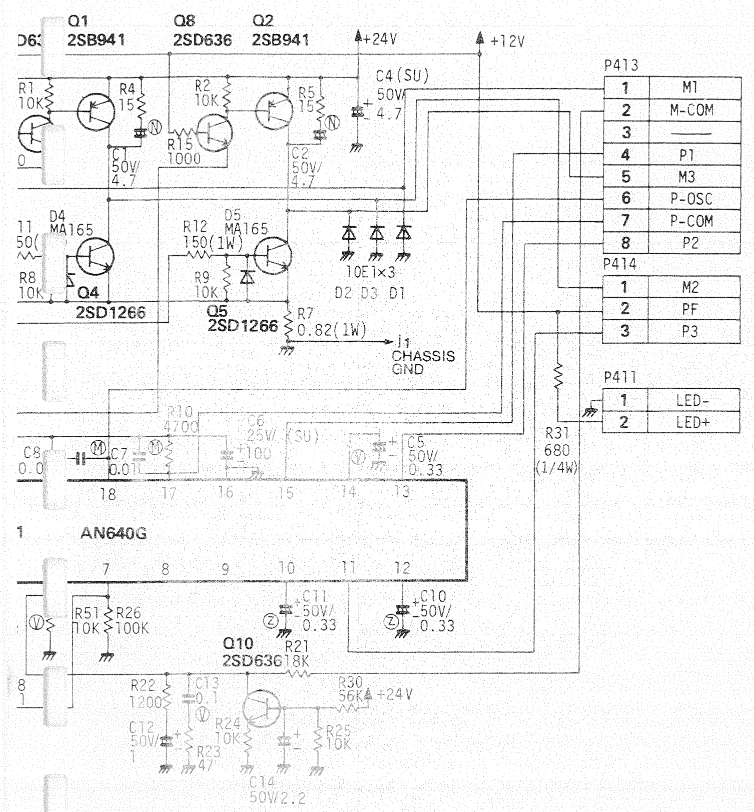


REVERSE SIDE

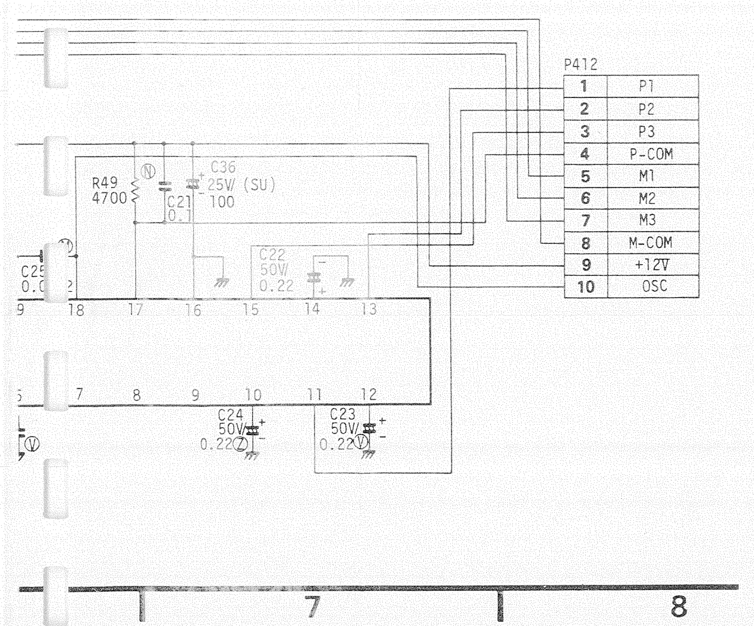
REEL DRIVE

REEL DRIVE SCHEMATIC DIAGRAM

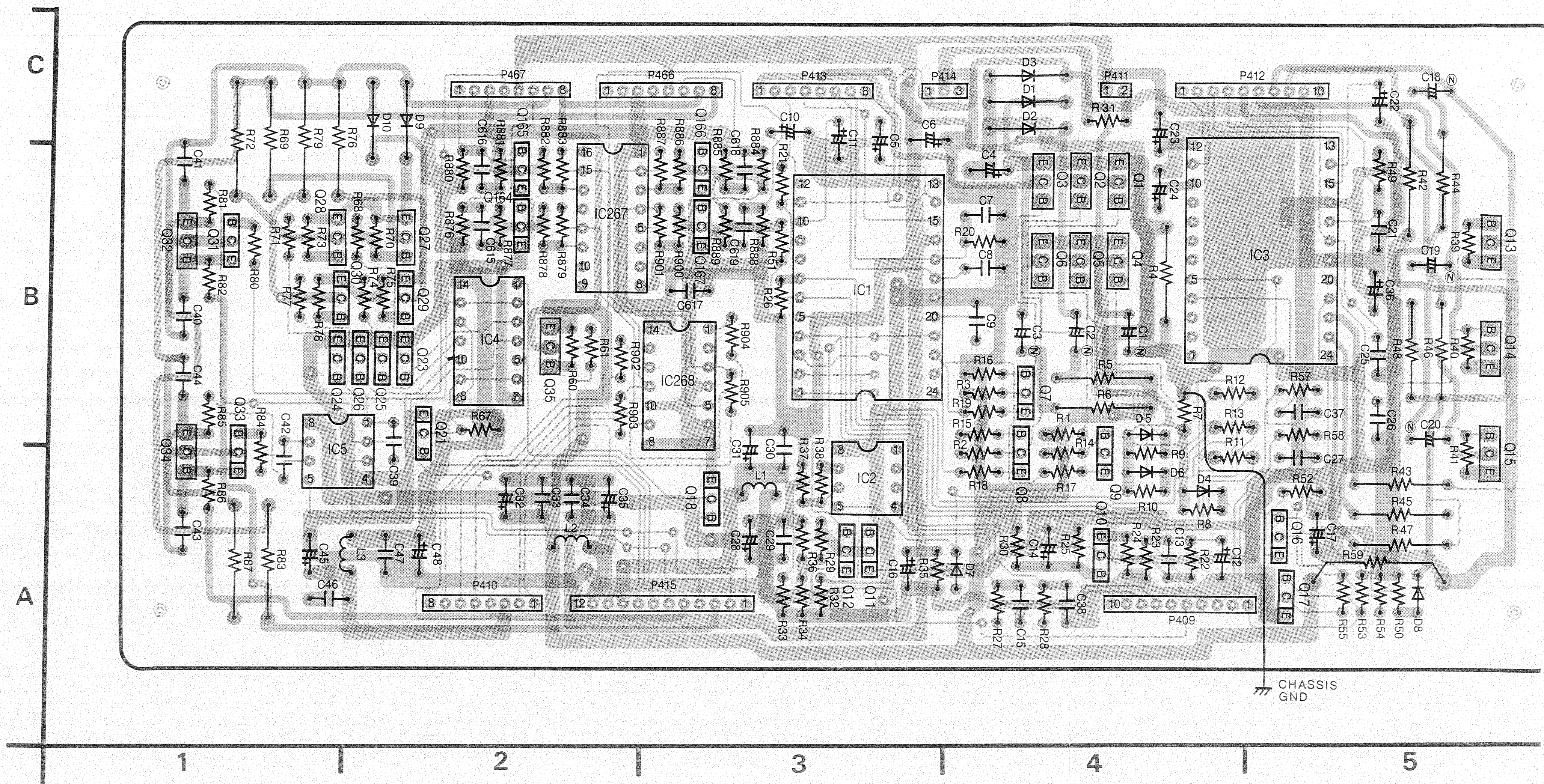


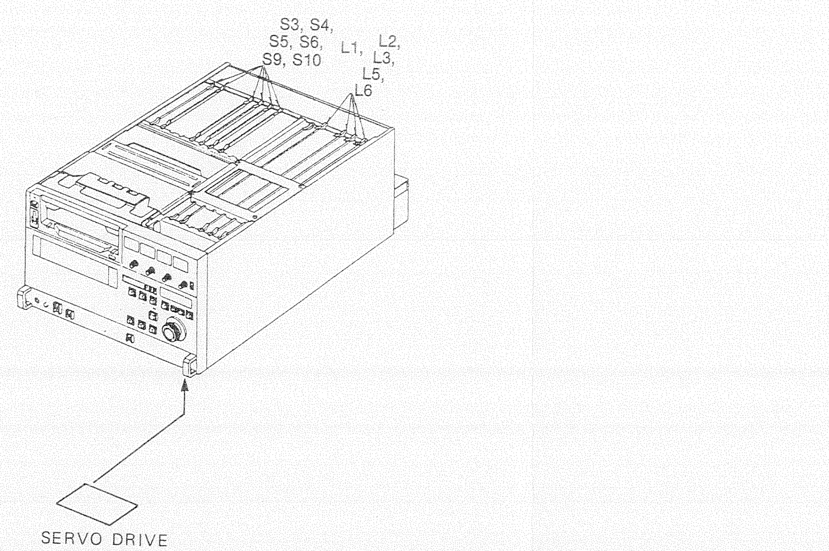


IM MOTOR DRIVE)

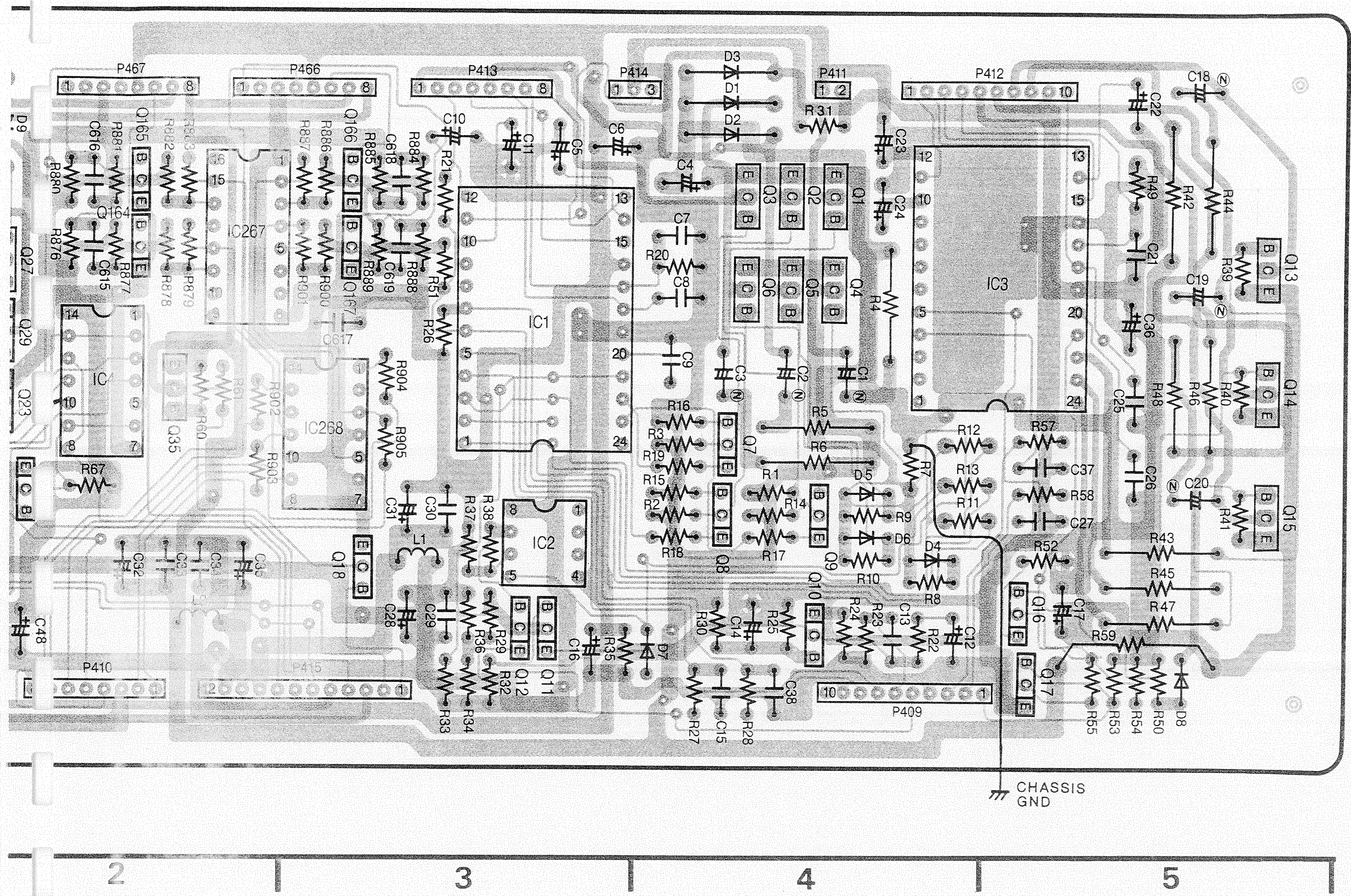


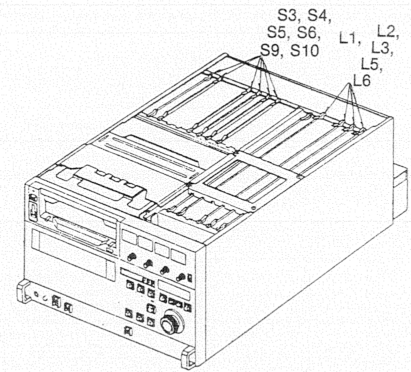
REEL DRIVE P.C. BOARD (VEP82035A)

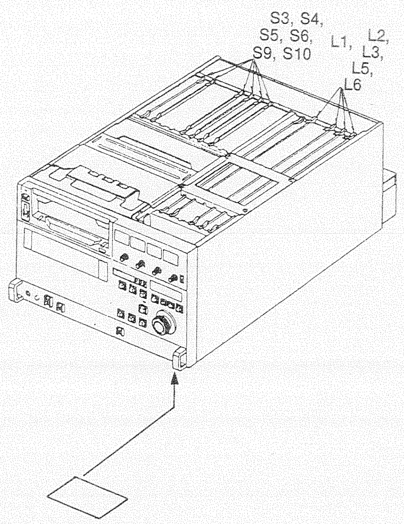




EP82035A)







REEL DRIVE	
Transistors	
Q1	B-4
Q2	B-4
Q3	B-4
Q4	B-4
Q5	B-4
Q6	B-4
Q7	B-4
Q8	A-4
Q9	A-4
Q10	A-4
Q11	A-3
Q12	A-3
Q13	B-5
Q14	B-5
Q15	A-5
Q16	A-5
Q17	A-5
Q18	A-3
Q21	B-2
Q24	B-1
Q25	B-2
Q26	B-2
Q27	B-2
Q28	B-1
Q29	B-2
Q30	B-1
Q31	B-1
Q32	B-1
Q33	A-1
Q34	A-1
Q35	B-2
Q164	B-2
Q165	B-2
Q166	B-3
Q167	B-3
Integrated Circuits	
IC1	B-3
IC2	A-3
IC3	B-5
IC4	B-2
IC5	A-1
IC267	B-2
IC268	B-3

ADDRESS INFORMATION

SYSTEM CONTROL & TC (L6)

Transistors	
Q1	D-5
Q2	C-18
Q3	E-5
Q4	D-6
Q5	D-6
Q6	B-16
Q7	B-5
Q8	B-5
Q9	B-15
Q10	B-15
Q11	A-16
Q12	A-16
Q13	A-16
Q14	A-15
Q15	D-14
Q16	D-14
Q17	D-15
Q18	E-14
Q19	E-14
Q20	E-14
Q21	F-20
Q23	F-21
Q24	E-21
Q25	E-21
Q26	E-21
Q27	E-22
Q28	E-22
Q29	F-21
Q30	F-21
Q31	F-21
Q32	F-21
Q33	F-21
Q34	F-21
Q35	F-21
Q36	F-21
Q37	F-20
Q38	F-20
Q39	E-21
Q40	D-21
Q41	F-20
Q42	E-18
Q43	E-19
Q44	F-20
Q45	E-19
Q46	E-19
Q47	C-21
Q48	B-16
Q49	D-21
Q52	C-21
Q53	C-21
Q54	D-22
Q55	D-22
Q56	D-22
Q57	C-22
Q60	B-21
Q61	D-21
Q62	B-21
Q63	D-21
Q64	D-21
Q65	D-21
Q66	D-21
Q67	B-21
Q68	B-21
Q72	D-8
Q301	B-9
Q302	C-14
Q303	B-12
Q304	B-10
Q305	B-12
Q306	C-11
Q307	B-9
Q308	B-13
Q309	C-13
Q311	B-14
Q312	C-10
Q313	C-13
Q314	C10
Q316	C-9

Integrated Circuits	
IC1	E-2
IC2	E-21
IC3	E-20
IC4	E-3
IC5	B-2
IC6	B-2
IC7	A-21
IC8	B-20
IC9	D-2
IC10	D-3
IC11	C-18
IC12	D-19
IC13	D-19
IC14	C-19
IC15	B-3
IC16	E-5
IC17	C-5
IC18	B-20
IC19	C-5
IC21	E-5
IC22	E-17
IC23	C-17
IC25	D-17
IC26	D-18
IC27	E-6
IC28	B-16
IC29	E-5
IC29	C-15
IC30	B-15
IC31	B-15
IC32	D-15
IC33	C-15
IC34	C-7
IC35	D-8
IC36	D-9
IC37	E-15
IC38	E-14
IC39	B-21
IC40	D-19
IC42	A-21
IC43	A-22
IC44	A-21
IC45	A-22
IC46	E-16
IC47	E-16
IC50	E-20
IC51	D-20
IC52	B-18
IC54	D-19
IC55	C-19
IC56	D-19
IC57	A-20
IC58	B-16
IC59	B-16
IC60	D-17
IC61	C-18
IC62	C-6
IC63	D-16
IC64	B-14
IC65	E-16
IC69	E-4
IC70	C-1
IC71	C-1
IC72	D-1
IC73	E-8
IC300	E-11
IC301	E-11
IC301	C-9
IC302	D-11
IC303	E-9
IC304	E-13
IC305	E-10
IC306	E-13
IC307	D-12
IC308	D-10
IC309	C-12
IC310	E-13
IC311	C-13
IC312	D-12
IC313	C-11
IC314	C-14
IC315	B-11
IC316	B-10
IC317	A-10
IC318	B-9
IC319	C-10
IC320	B-10
IC321	E-12
IC322	E-10
IC323	C-11
IC324	D-13

Test Points	
TP2	A-4
TP3	C-8
TP4	E-2
TP5	C-8
TP6	C-3
TP7	B-3
TP8	B-3
TP9	C-3
TP10	C-6
TP11	C-6
TP12	C-5
TP13	C-5
TP14	B-3
TP15	B-3
TP16	D-5
TP17	B-7
TP18	E-6
TP19	E-7
TP20	C-9
TP21	F-9
TP23	D-6
TP24	D-7
TP25	E-8
TP26	B-6
TP27	B-6
TP28	C-8
TP29	E-8
TP36	D-6
TP302	B-9
TP303	C-9
TP304	A-10
TP305	C-9
TP306	B-10

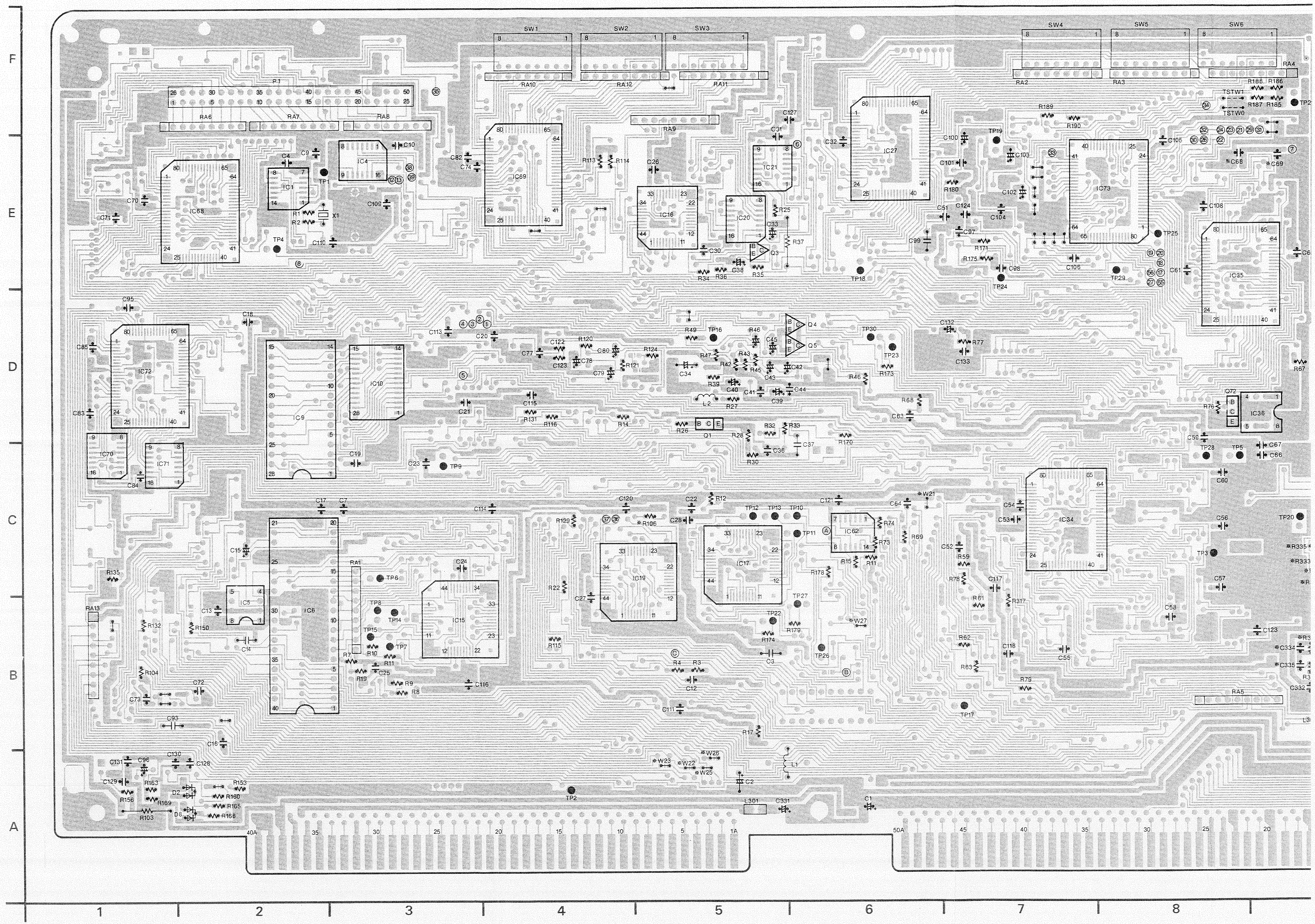
Adjustments	
VR301	F-10

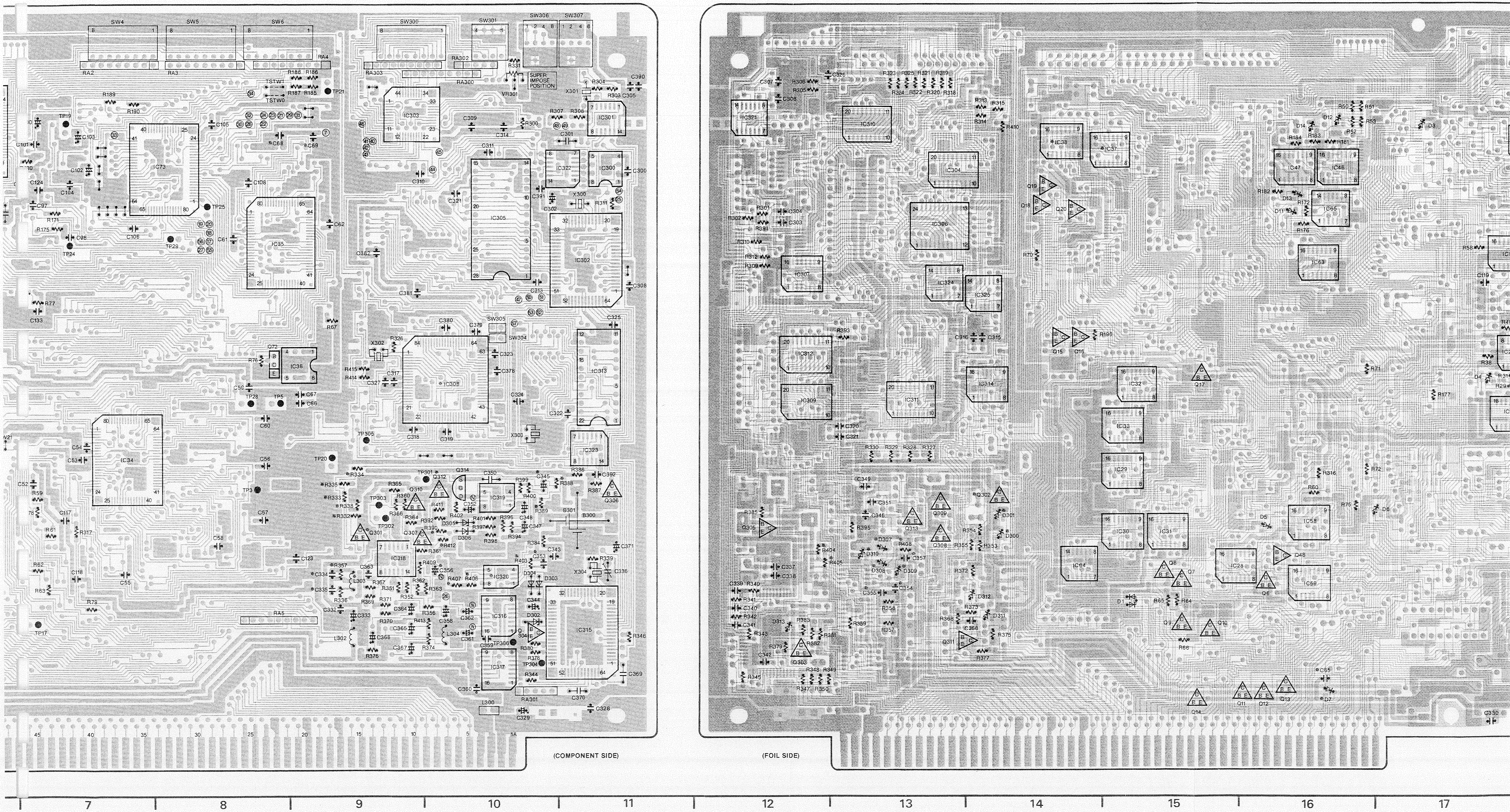
ADDRESS INFORMATION

(L6) SYSTEM CONTROL & TC P.C.B.		
	AU-650B	AU-630
C29	0.1	—
C65	0.01	—
C68	0.01	—
C69	0.01	—
C75	0.1	—
C81	10V47	—
C334	680P	—
C335	68P	—
C345	25V4.7	—
C353	150P	—
C354	0.1	—
C355	0.1	—
C356	25V4.7	—
C357	0.1	—
D7	MA151K	—
D300	MA151K	—
D301	MA151K	—
D307	MA151K	—
D308	MA151K	—
D309	MA151K	—
D310	MA151K	—
IC37	MC14021BF	—
IC38	MC14021BF	—
IC320	UPC45586	—
L303	VLQEL06F3R3T	—
Q23	DTC114YK	—
Q29	DTC114YK	—
Q31	DTC114YK	—
Q32	DTC114YK	—
Q33	DTC114YK	—
Q34	DTC114YK	—
Q40	DTC114YK	—
Q45	DTC114YK	—
Q52	DTC114YK	—
Q53	DTC114YK	—
Q66	DTC114YK	—
Q67	DTC114YK	—
Q301	2SD601	—
Q302	2SB710	—
Q312	2SD601	—
R78	1000	—
R106	100	—
R332	12K	—
R333	4.7	—
R334	68	—
R335	4.7	—
R336	100	—
R337	1500	—
R338	4700	—
R388	6800	—
R389	2200	—
R390	2200	—
R403	33K	—
R404	10K	—
R405	10K	—
R406	220K	—
R407	33K	—
R408	10K	—
R412	68	—
W21	—	○
W22	○	—
W23	○	—
W24	○	—
W25	—	○
W26	—	○
W27	—	○

COMPARISON CHART

L6 SYSTEM CONTROL & TC P.C. BOARD (VEP86047K)




(COMPONENT SIDE)
(FOIL SIDE)
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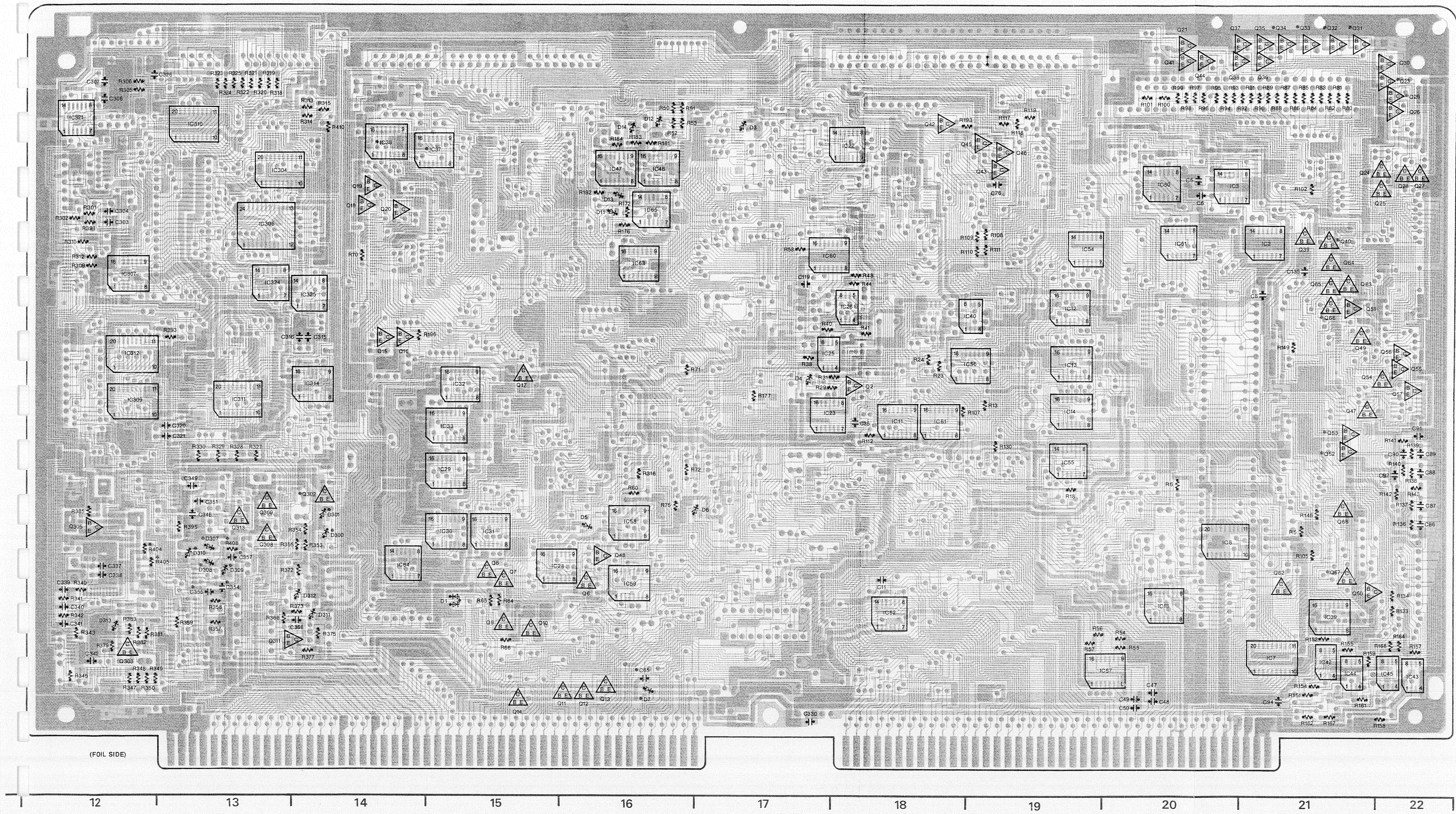
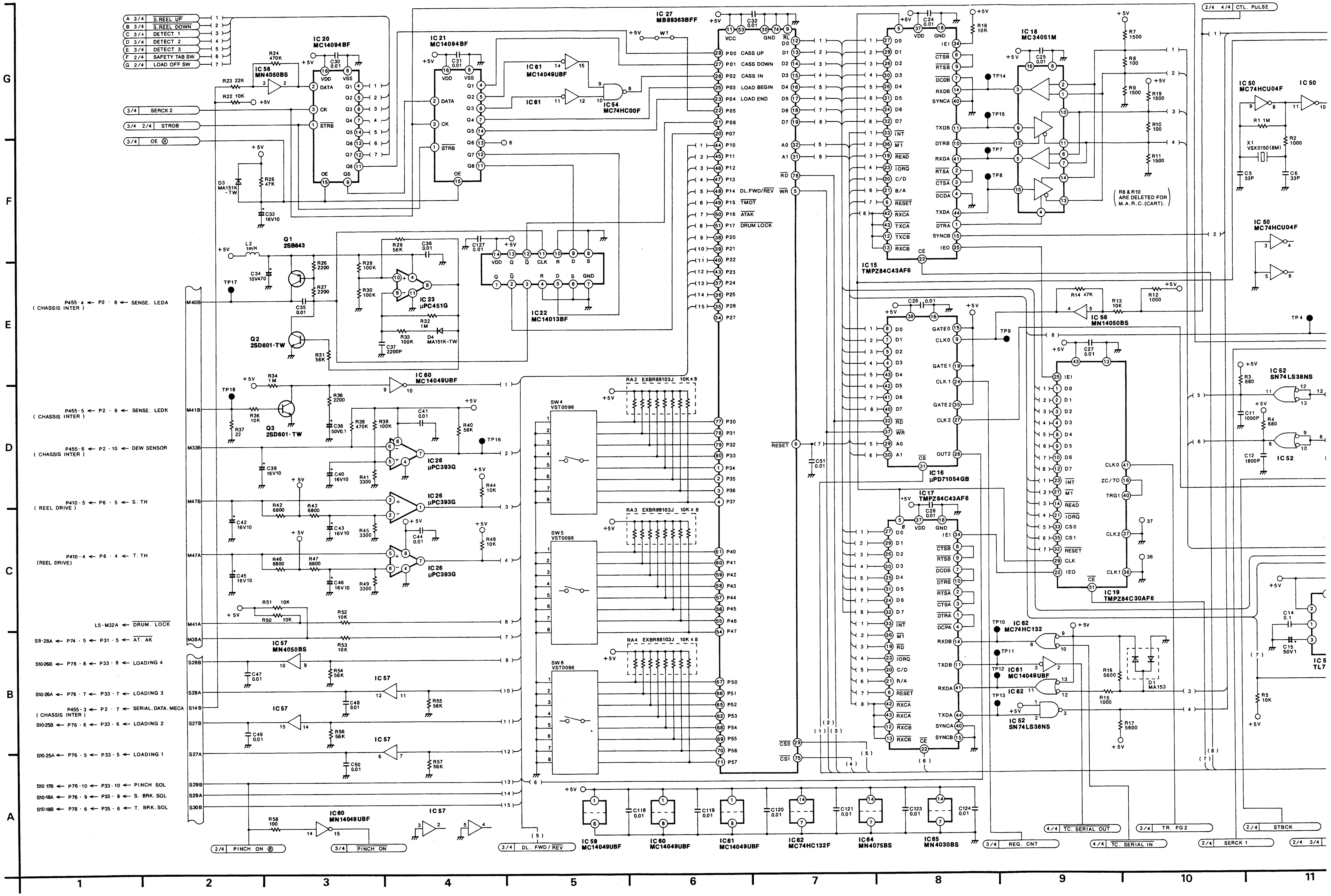
16
17

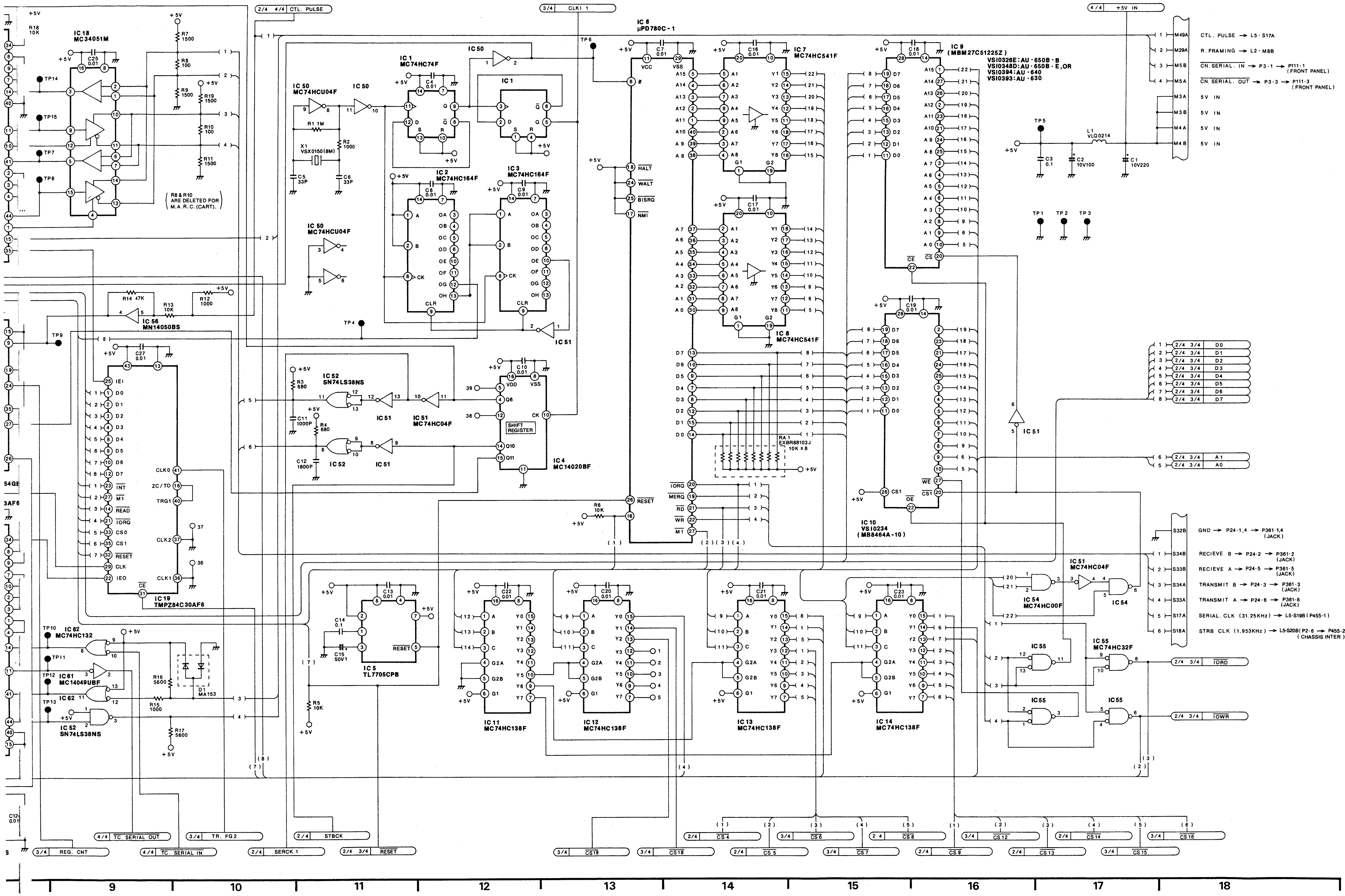


REVERSE SIDE

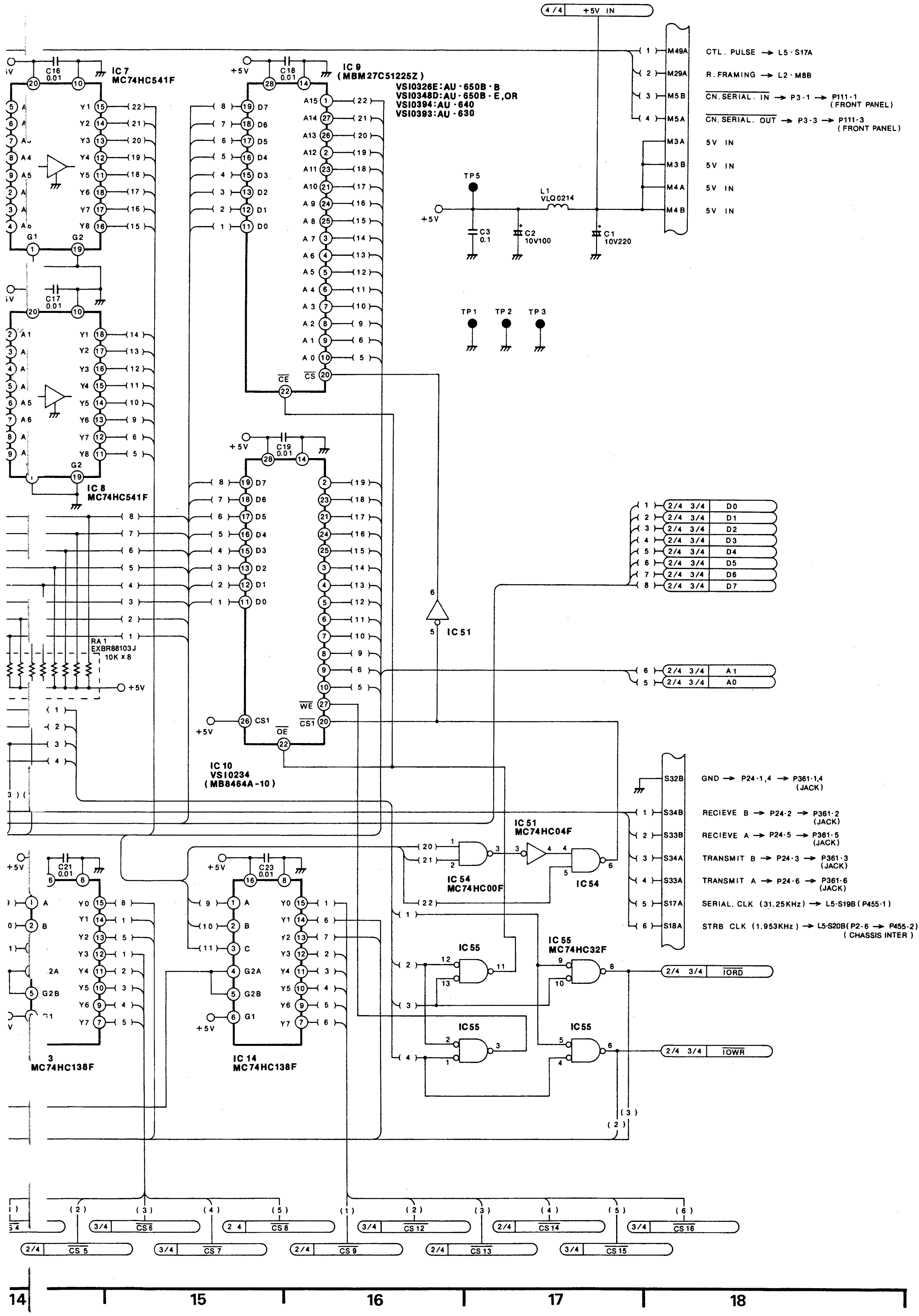
**L6 SYSTEM CTL & TC
SCHEMATIC DIAGRAM (1/4)**

L6 SYSTEM COTNROL & TC SCHEMATIC DIAGRAM (1/4)





IC 18 MC34051M
IC 50 MC74HCU04F
IC 1 MC74HC74F
IC 2 MC74HC164F
IC 3 MC74HC164F
IC 6 μPD780C-1
IC 7 MC74HC541F
IC 8 MC74HC541F
IC 9 (MBM27C51225Z)
VSI0326E:AU-650B-B
VSI0348D:AU-650B-E,OR
VSI0394:AU-640
VSI0393:AU-630
IC 10 VSI0234 (MB8464A-10)
IC 56 MN14050BS
IC 19 TMPZ84C30AF6
IC 52 SN74LS38NS
IC 51 MC74HC04F
IC 4 MC14020BF
IC 5 TL7705CPB
IC 11 MC74HC138F
IC 12 MC74HC138F
IC 13 MC74HC138F
IC 14 MC74HC138F
IC 54 MC74HC00F
IC 55 MC74HC32F
IC 62 MC74HC132
IC 61 MC14049UBF
(R8 & R10 ARE DELETED FOR M.A.R.C. (CART).)
CTL. PULSE → L5·S17A
R. FRAMING → L2·M8B
CN. SERIAL. IN → P3-1 → P111-1 (FRONT PANEL)
CN. SERIAL. OUT → P3-3 → P111-3 (FRONT PANEL)
5V IN
GND → P24-1,4 → P361-1,4 (JACK)
RECIEVE B → P24-2 → P361-2 (JACK)
RECIEVE A → P24-5 → P361-5 (JACK)
TRANSMIT B → P24-3 → P361-3 (JACK)
TRANSMIT A → P24-6 → P361-6 (JACK)
SERIAL. CLK (31.25KHz) → L5-S19B (P455-1)
STRB CLK (1.953KHz) → L5-S20B (P2-6 → P455-2) (CHASSIS INTER)
4/4 TC. SERIAL OUT
4/4 TC. SERIAL IN
3/4 REG. CNT
3/4 TR. FG2
2/4 SERCK 1
2/4 STBCK
2/4 3/4 RESET
2/4 4/4 CTL. PULSE
3/4 CLK1 1
4/4 +5V IN
2/4 3/4 IORQ
2/4 3/4 IOWR
9 10 11 12 13 14 15 16 17 18

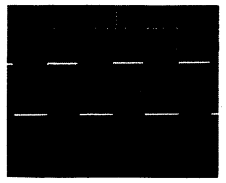


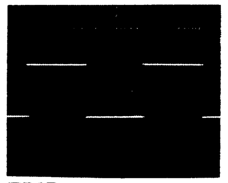
COMPARISON CHART

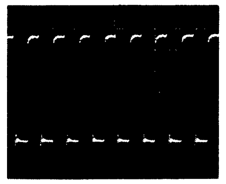
(L6) SYSTEM CONTROL & TC P.C.B.		
	AU-650B	AU-630
C29	0.1	—
C65	0.01	—
C68	0.01	—
C69	0.01	—
C75	0.1	—
C81	10V47	—
C334	680P	—
C335	68P	—
C345	25V4.7	—
C353	150P	—
C354	0.1	—
C355	0.1	—
C356	25V4.7	—
C357	0.1	—
D7	MA151K	—
D300	MA151K	—
D301	MA151K	—
D307	MA151K	—
D308	MA151K	—
D309	MA151K	—
D310	MA151K	—
IC37	MC14021BF	—
IC38	MC14021BF	—
IC320	UPC45586	—
L303	VLQEL06F3R3T	—
Q23	DTC114YK	—
Q29	DTC114YK	—
Q31	DTC114YK	—
Q32	DTC114YK	—
Q33	DTC114YK	—
Q34	DTC114YK	—
Q40	DTC114YK	—
Q45	DTC114YK	—
Q52	DTC114YK	—
Q53	DTC114YK	—
Q66	DTC114YK	—
Q67	DTC114YK	—
Q301	2SD601	—
Q302	2SB710	—
Q312	2SD601	—
R78	1000	—
R106	100	—
R332	12K	—
R333	4.7	—
R334	68	—
R335	4.7	—
R336	100	—
R337	1500	—
R338	4700	—
R388	6800	—
R389	2200	—
R390	2200	—
R403	33K	—
R404	10K	—
R405	10K	—
R406	220K	—
R407	33K	—
R408	10K	—
R412	68	—
W21	—	○
W22	○	—
W23	○	—
W24	○	—
W25	—	○
W26	—	○
W27	—	○

○: PART IS MOUNTED
–: PART IS NOT MOUNTED

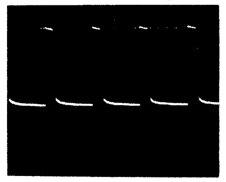
L6 SYSTEM CONTROL & TC WAVEFORMS

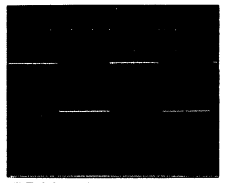

TP4
2V/0.5μsec. div.

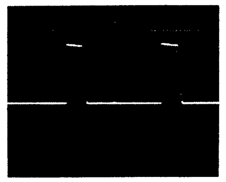

TP27
2V/2msec. div.

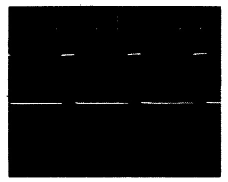

TP6
1V/0.2μsec. div.

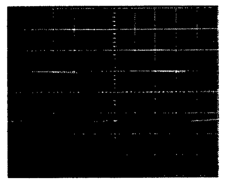

TP30
2V/10msec. div.

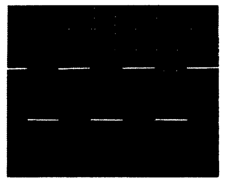

TP17
1V/1msec. div.

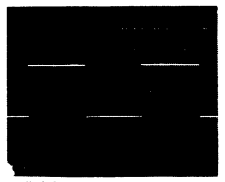

TP301, 302
2V/0.2msec. div.

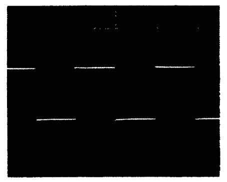

TP18
1V/0.5msec. div.


TP303
2V/20μsec. div.

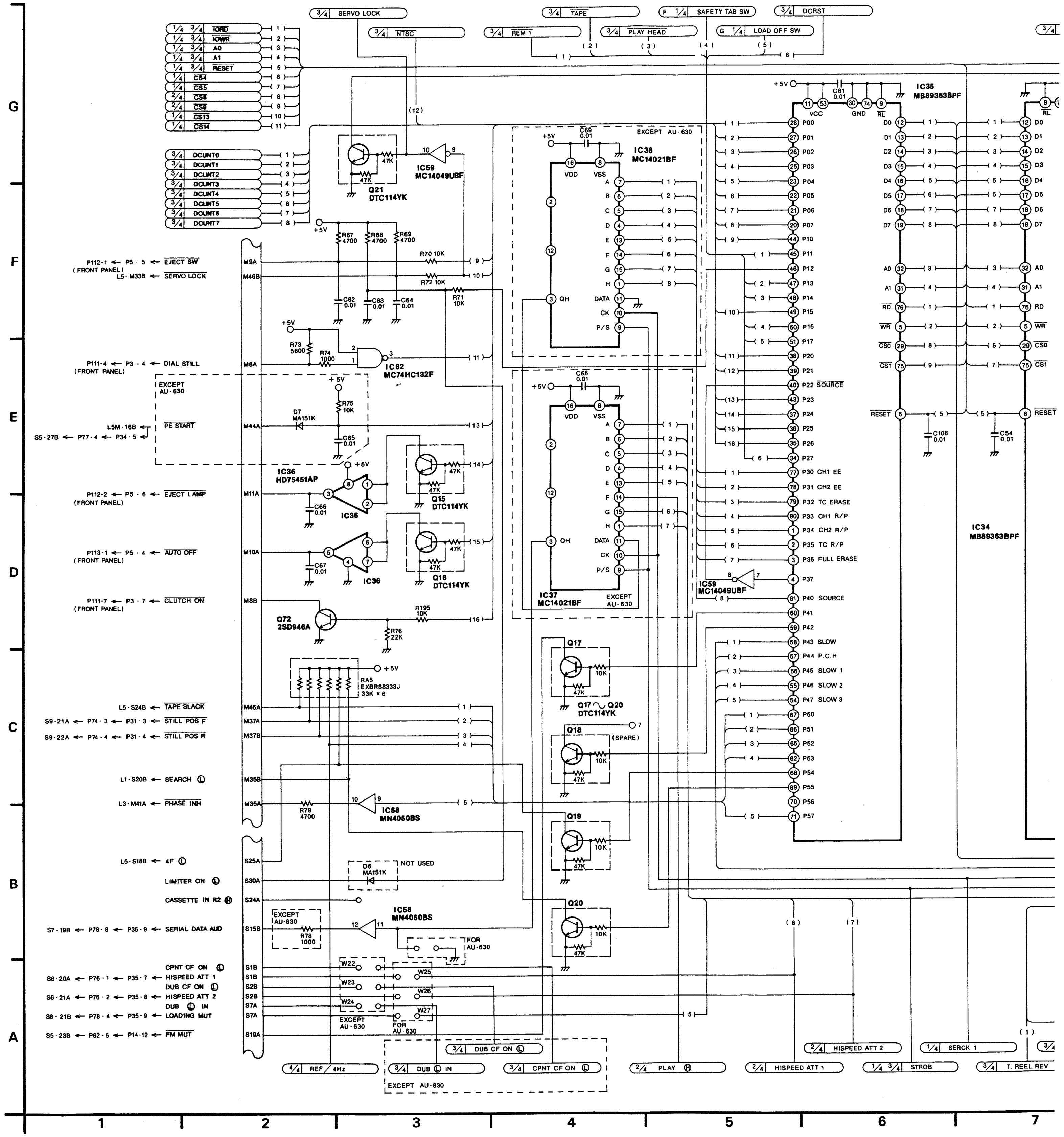

TP23
2V/20msec. div.


TP305
2V/5μsec. div.

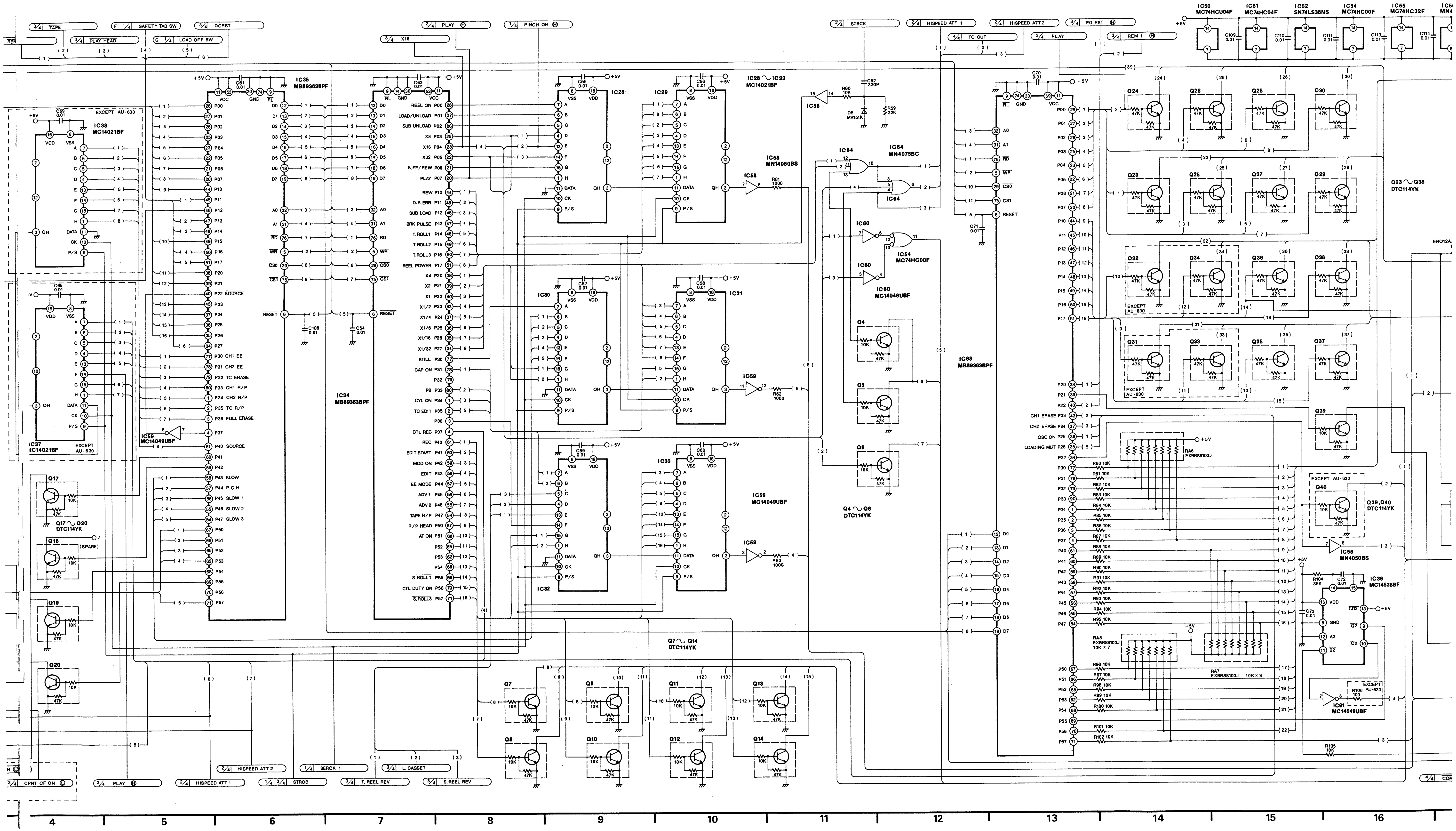

TP26
2V/2msec. div.

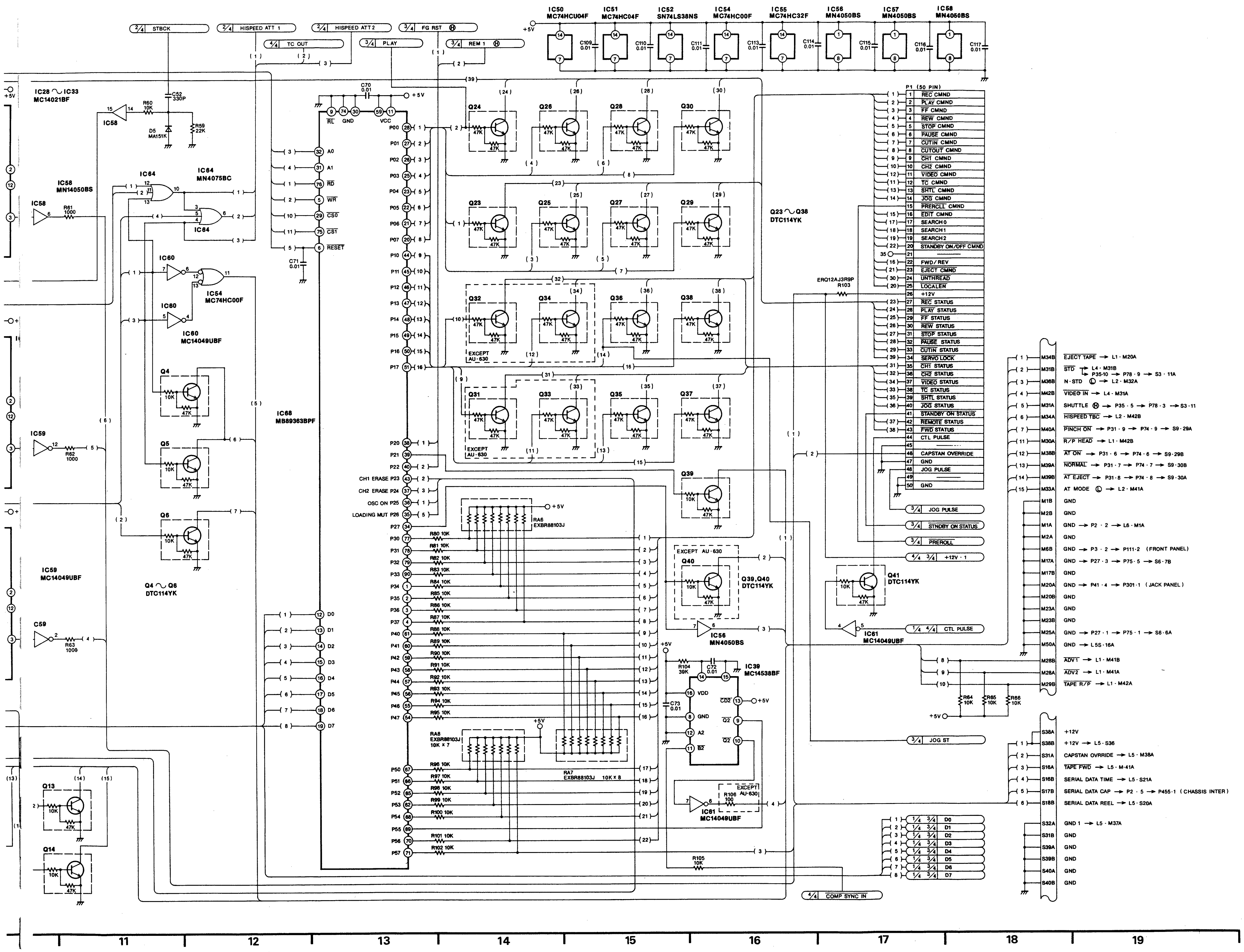

TP306
2V/0.5msec. div.

L6 SYSTEM COTNROL & TC SCHEMATIC DIAGRAM (2/4)



.T C DIAGRAM (2/4)

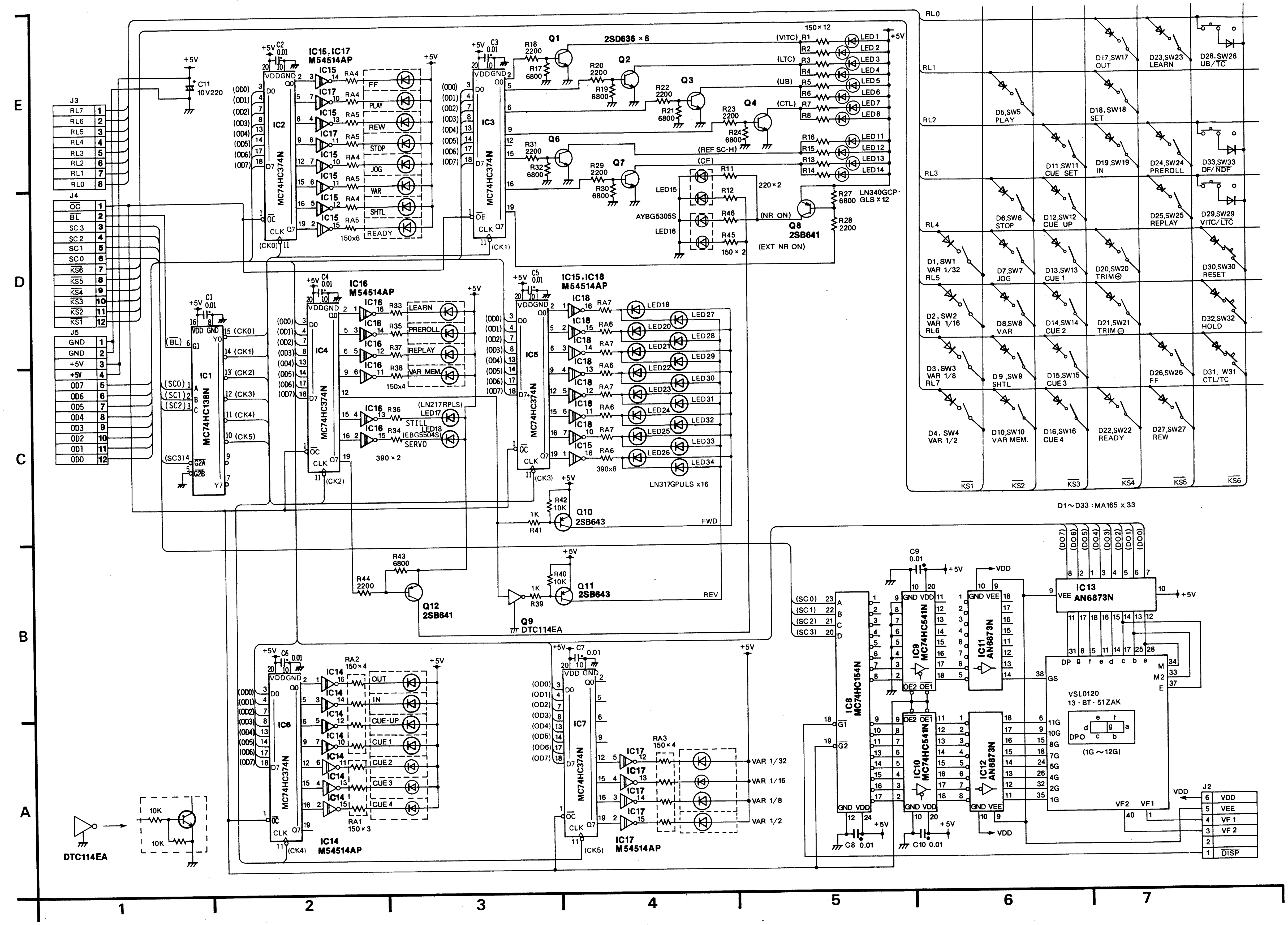




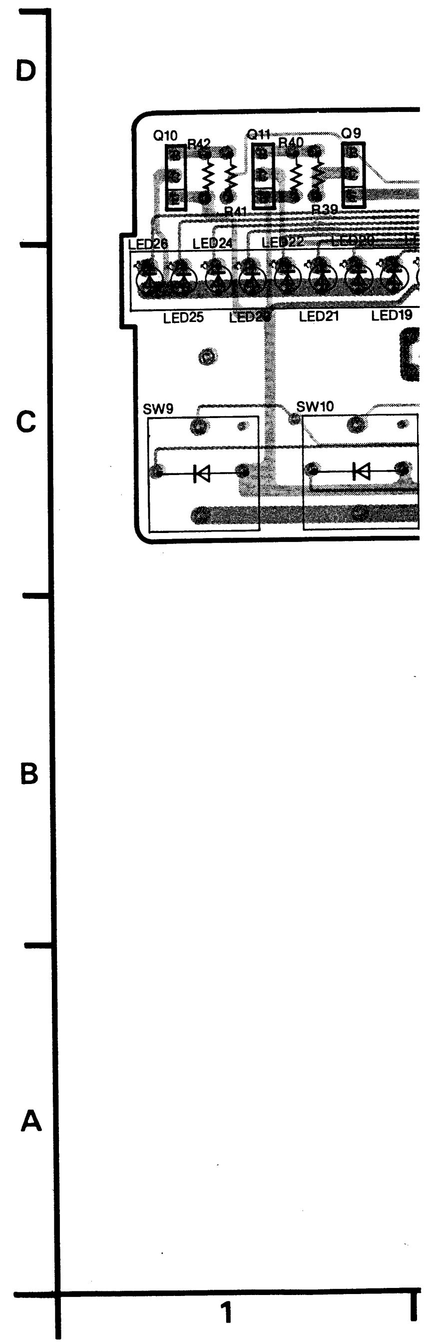
REVERSE SIDE

FRONT PANEL A

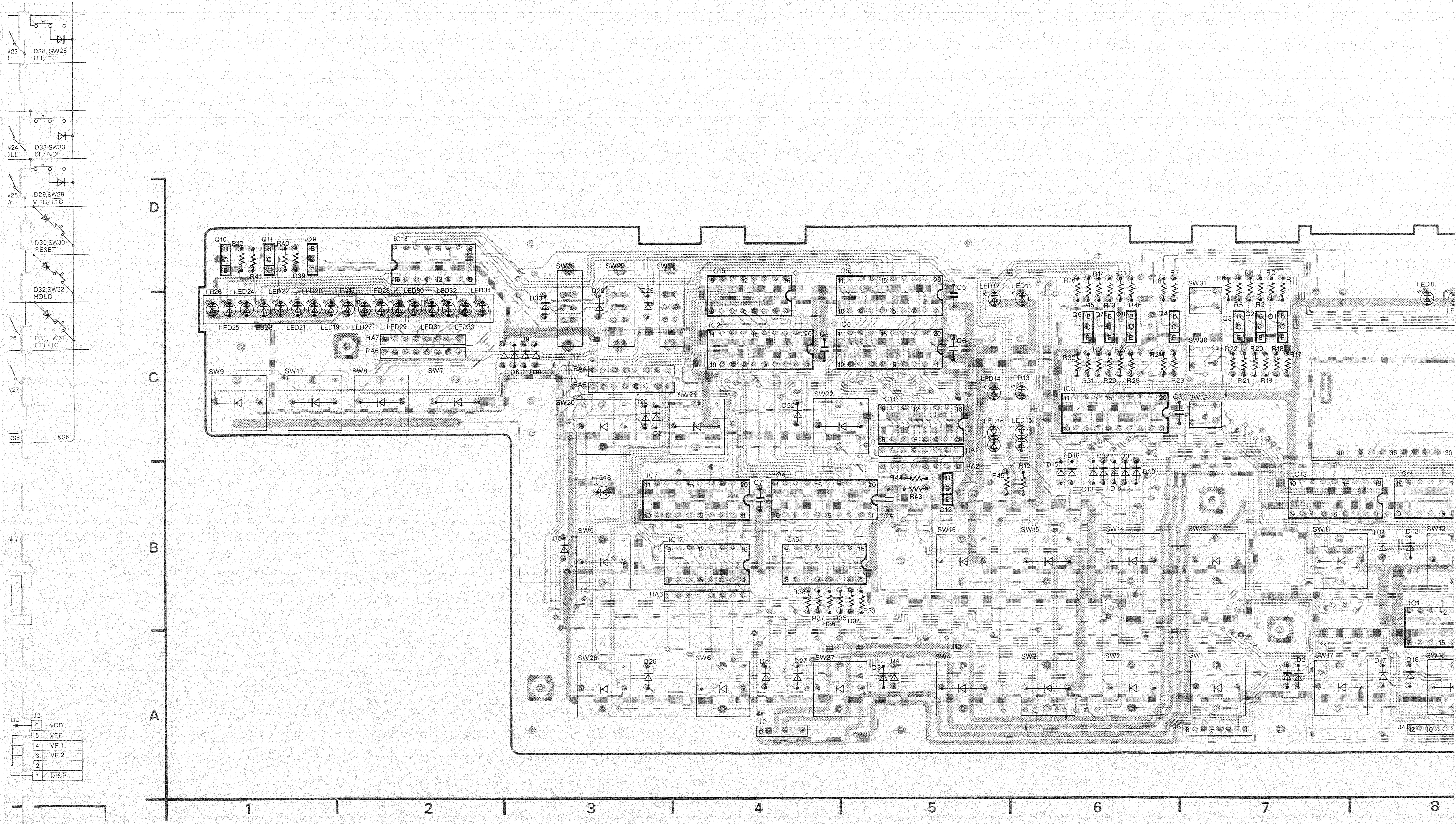
FRONT PANEL A SCHEMATIC DIAGRAM

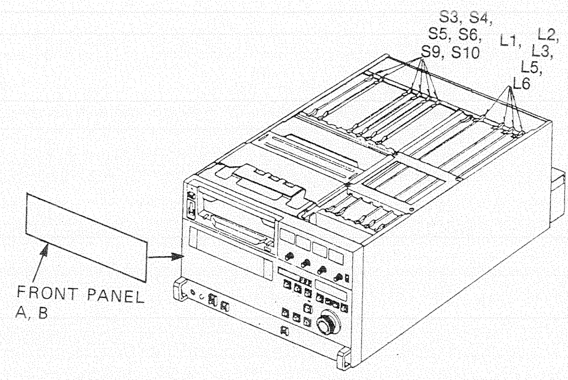


FRONT PANEL A F



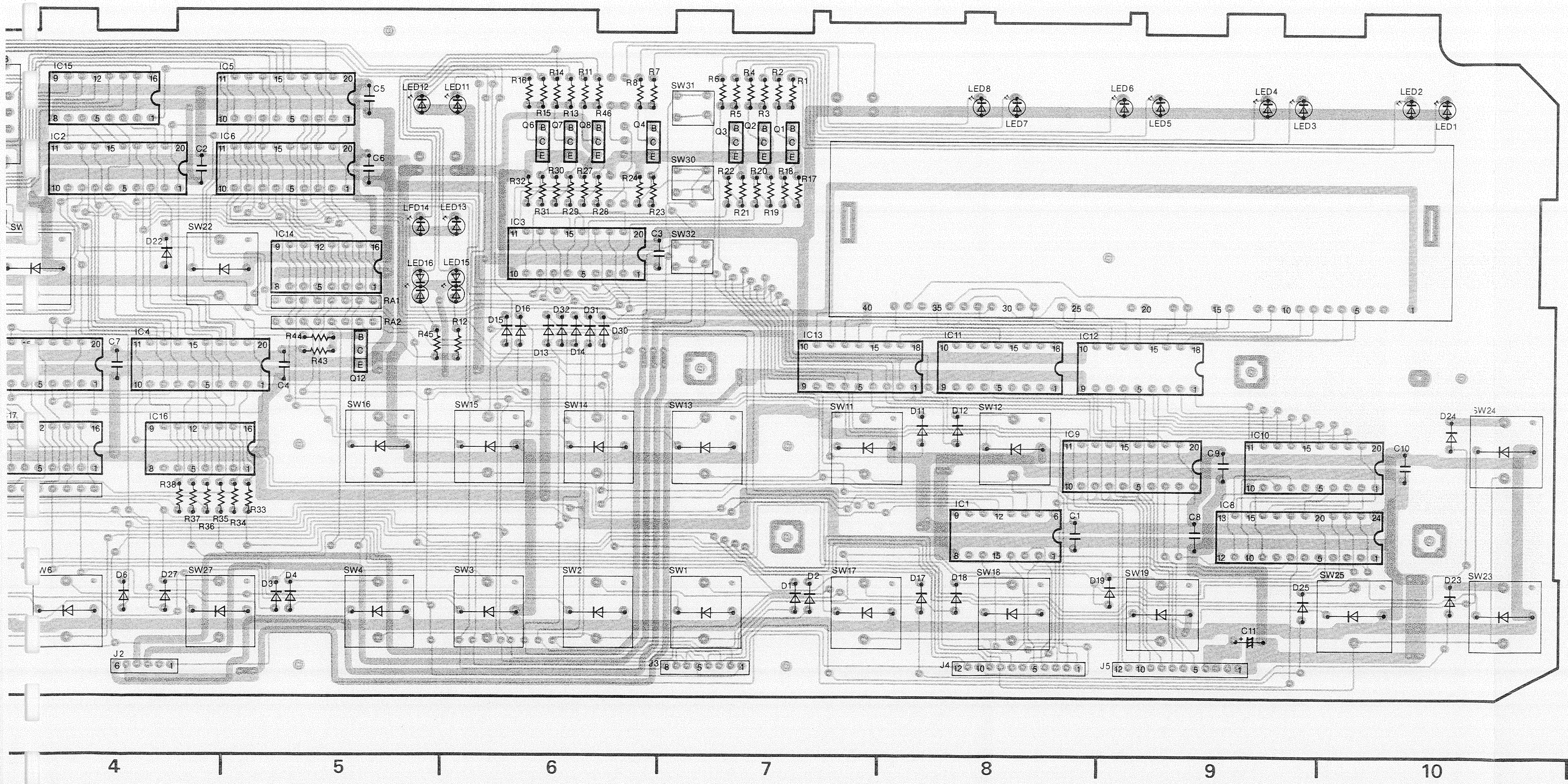
FRONT PANEL A P.C. BOARD (VEP86075B)



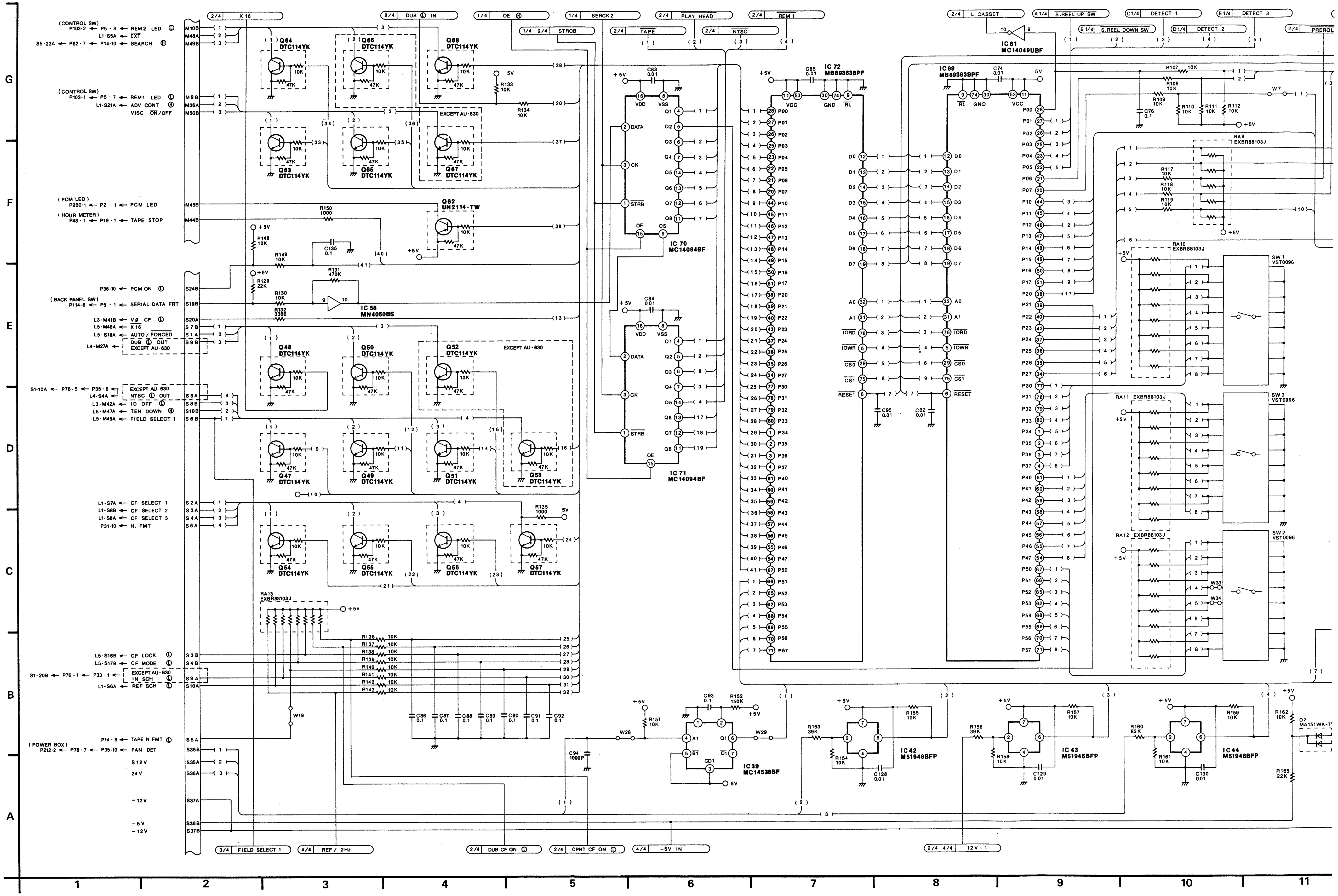


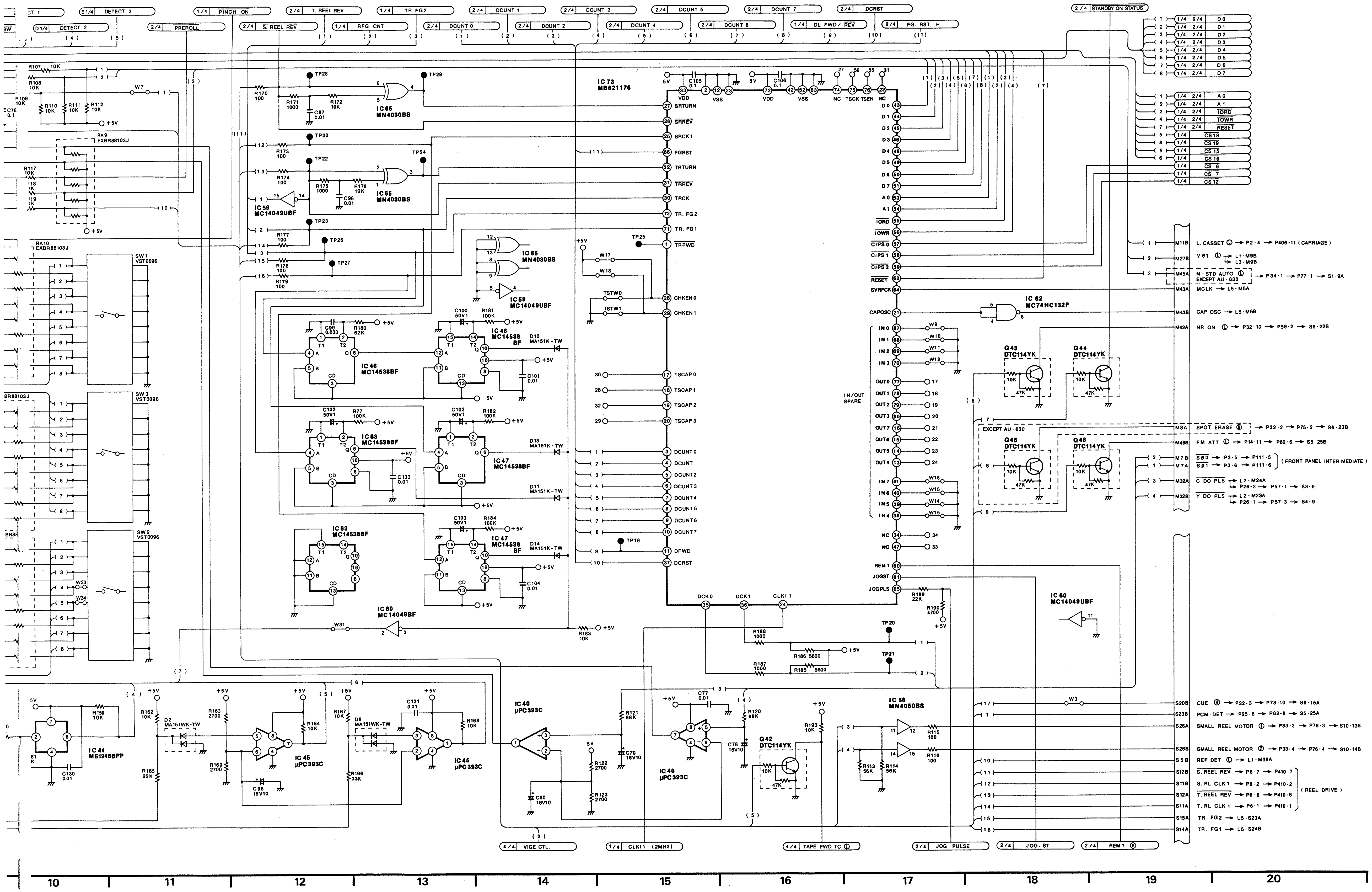
FRONT PANEL A	
Transistors	
Q1	C-7
Q2	C-7
Q3	C-7
Q4	C-6
Q6	C-6
Q7	C-6
Q8	C-6
Q9	D-11
Q10	D-1
Q11	D-1
Q12	B-5
Integrated Circuits	
IC1	B-8
IC2	C-4
IC3	C-6
IC4	B-4
IC5	C-5
IC6	C-5
IC7	B-4
IC8	B-9
IC9	B-9
IC10	B-9
IC11	B-8
IC12	B-9
IC13	B-7
IC14	C-5
IC15	D-4
IC16	B-4
IC17	B-4
IC18	D-2

ADDRESS INFORMATION

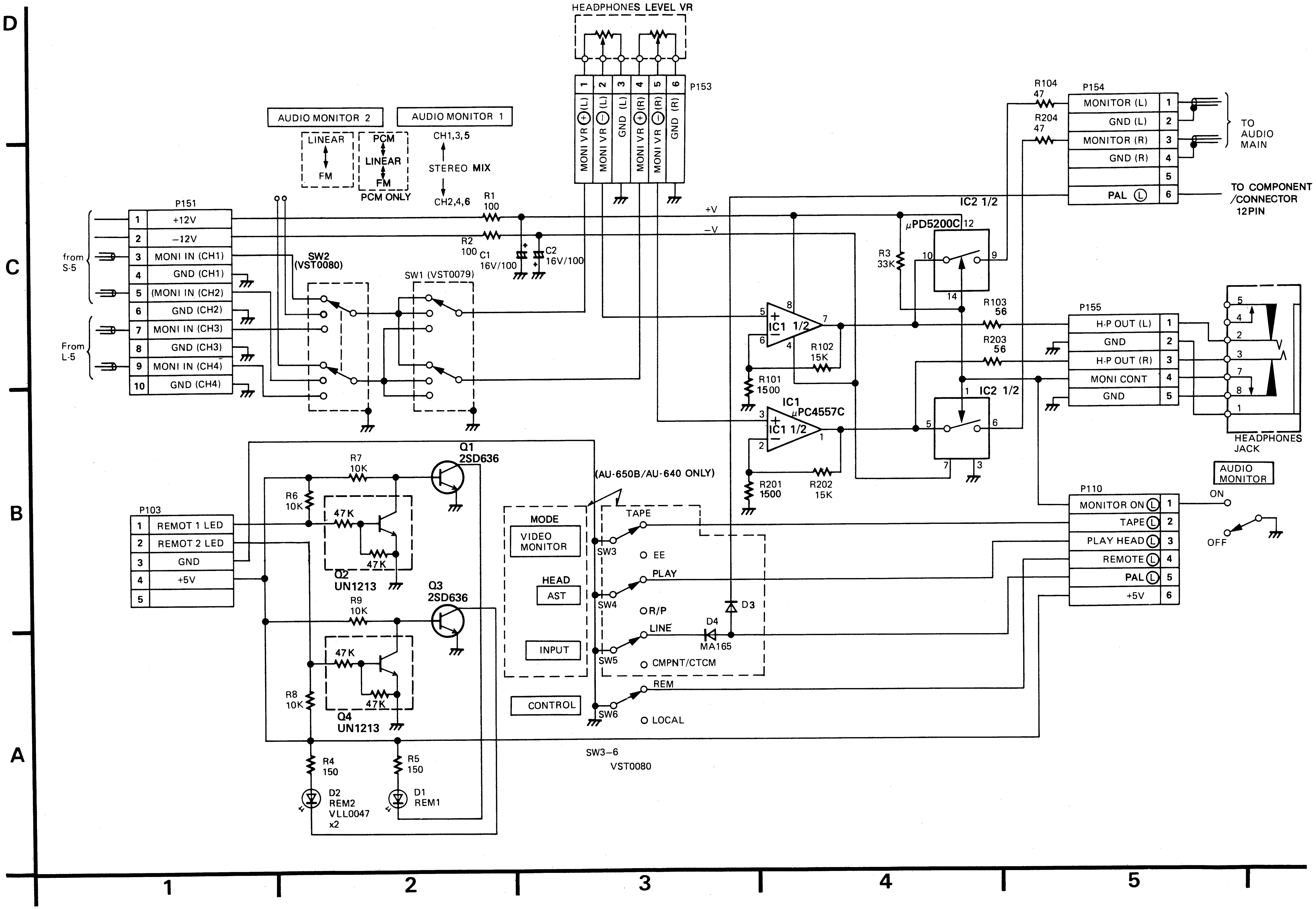


L6 SYSTEM CONTROL & TC SCHEMATIC DIAGRAM (3/4)




IC 73
MB621176
IC 65
MN4030BS
IC 59
MC14049UBF
IC 46
MC14538BF
IC 47
MC14538BF
IC 63
MC14538BF
IC 60
MC14049UBF
IC 62
MC74HC132F
Q43
DTC114YK
Q44
DTC114YK
Q45
DTC114YK
Q46
DTC114YK
Q42
DTC114YK
IC 44
M51946BFP
IC 45
µPC393C
IC 40
µPC393C
IC 56
MN4050BS
IN/OUT
SPARE
L. CASSET
N - STD AUTO
EXCEPT AU - 630
MCLK
CAP OSC
NR ON
SPOT ERASE
FM ATT
(FRONT PANEL INTER MEDIATE)
C DO PLS
Y DO PLS
CUE
PCM · DET
SMALL REEL MOTOR
REF DET
S. REEL REV
S. RL CLK 1
T. REEL REV
T. RL CLK 1
(REEL DRIVE)
TR. FG2
TR. FG1
VIGE CTL.
CLKI 1 (2MHz)
TAPE FWD TC
JOG. PULSE
JOG. ST
REM 1
STANDBY ON STATUS
10
11
12
13
14
15
16
17
18
19
20

CONTROL SW SCHEMATIC DIAGRAM



CONTROL S

A

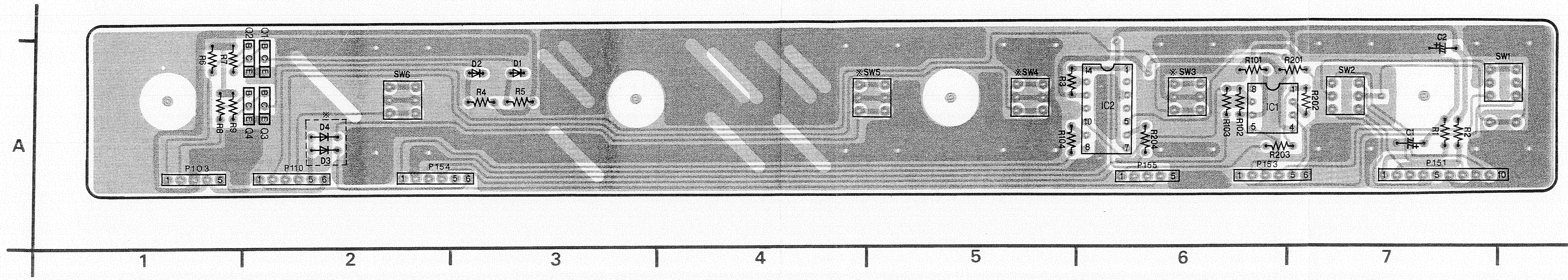
D3
D4
SW3
SW4
SW5

COMPARIS

REVERSE SIDE

L6 SYSTEM CTL & TC SCHEMATIC DIAGRAM (3/4)

CONTROL SW P.C. BOARD (VEP80311D)

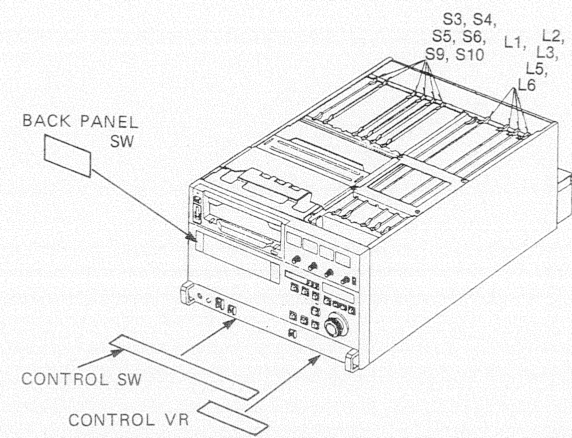


	CONTROL SW P.C.B.	
	AU-650B	AU-630
D3	MA165	—
D4	MA165	—
SW3	VST0080	—
SW4	VST0080	—
SW5	VST0080	—

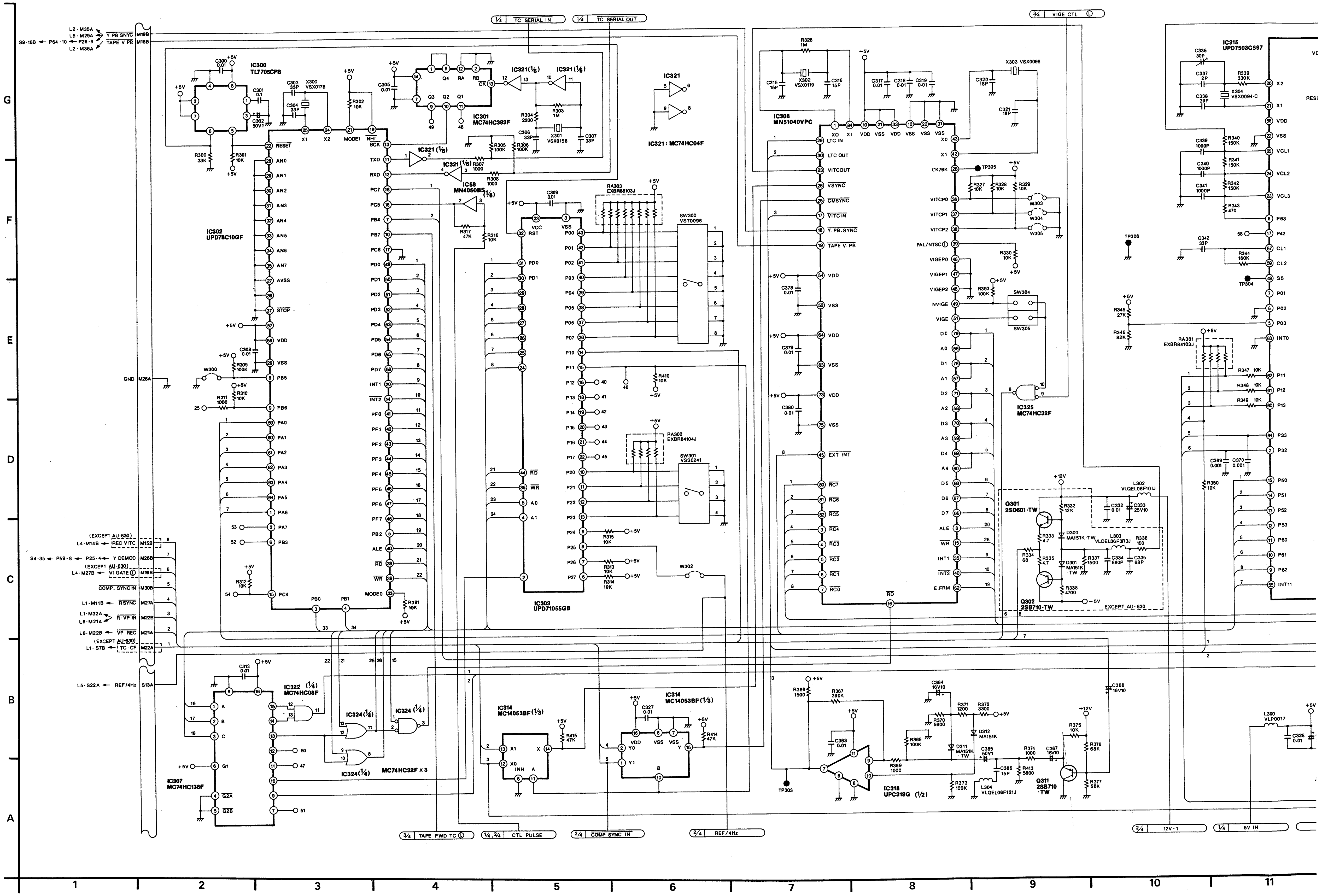
COMPARISON CHART

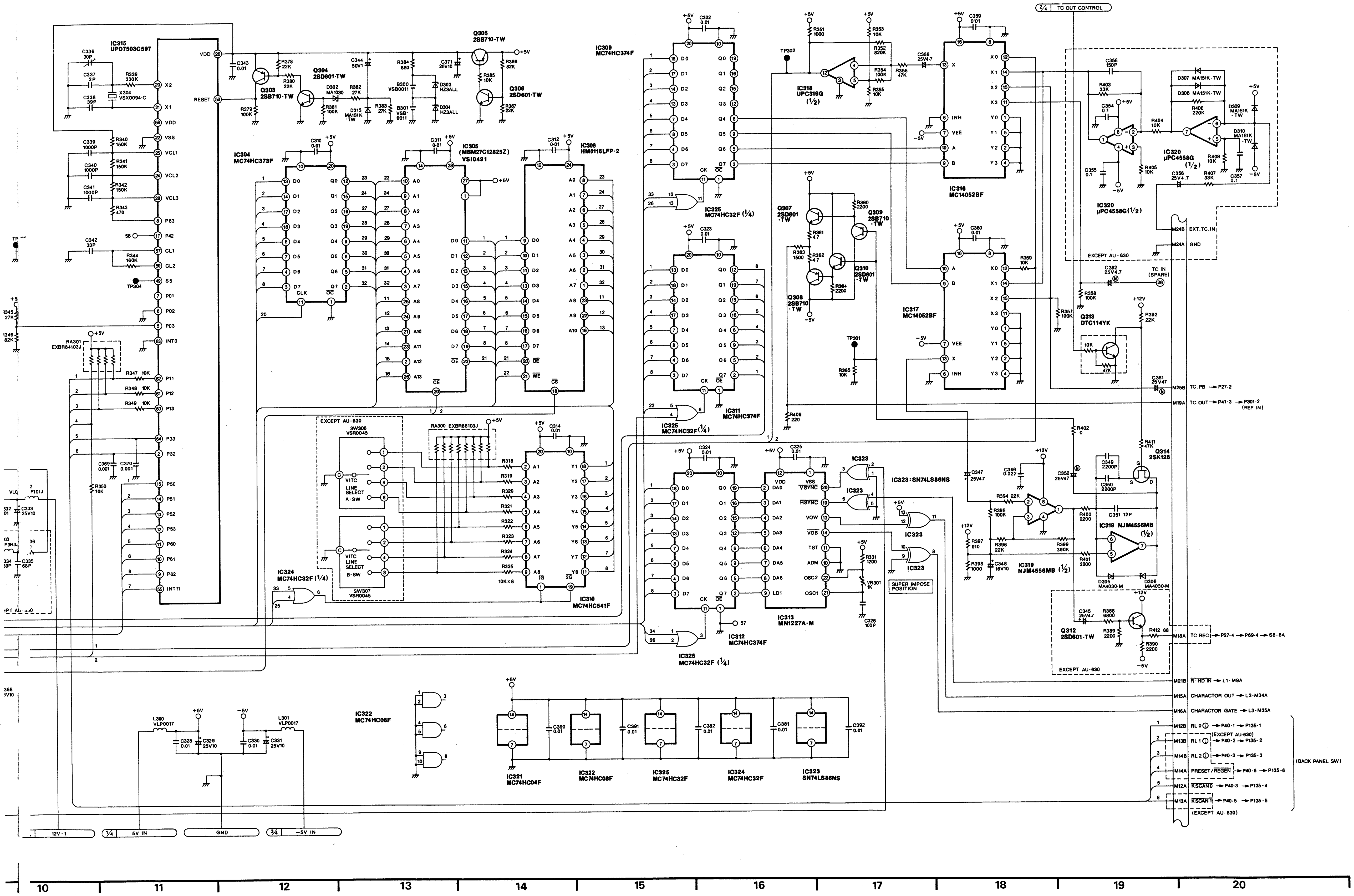
CONTROL SW	
Transistors	
Q1	A-2
Q2	A-2
Q3	A-2
Q4	A-2
Integrated Circuits	
IC1	A-6
IC2	A-6

ADDRESS INFORMATION

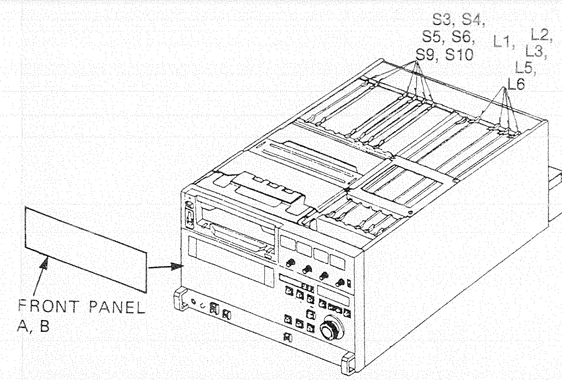


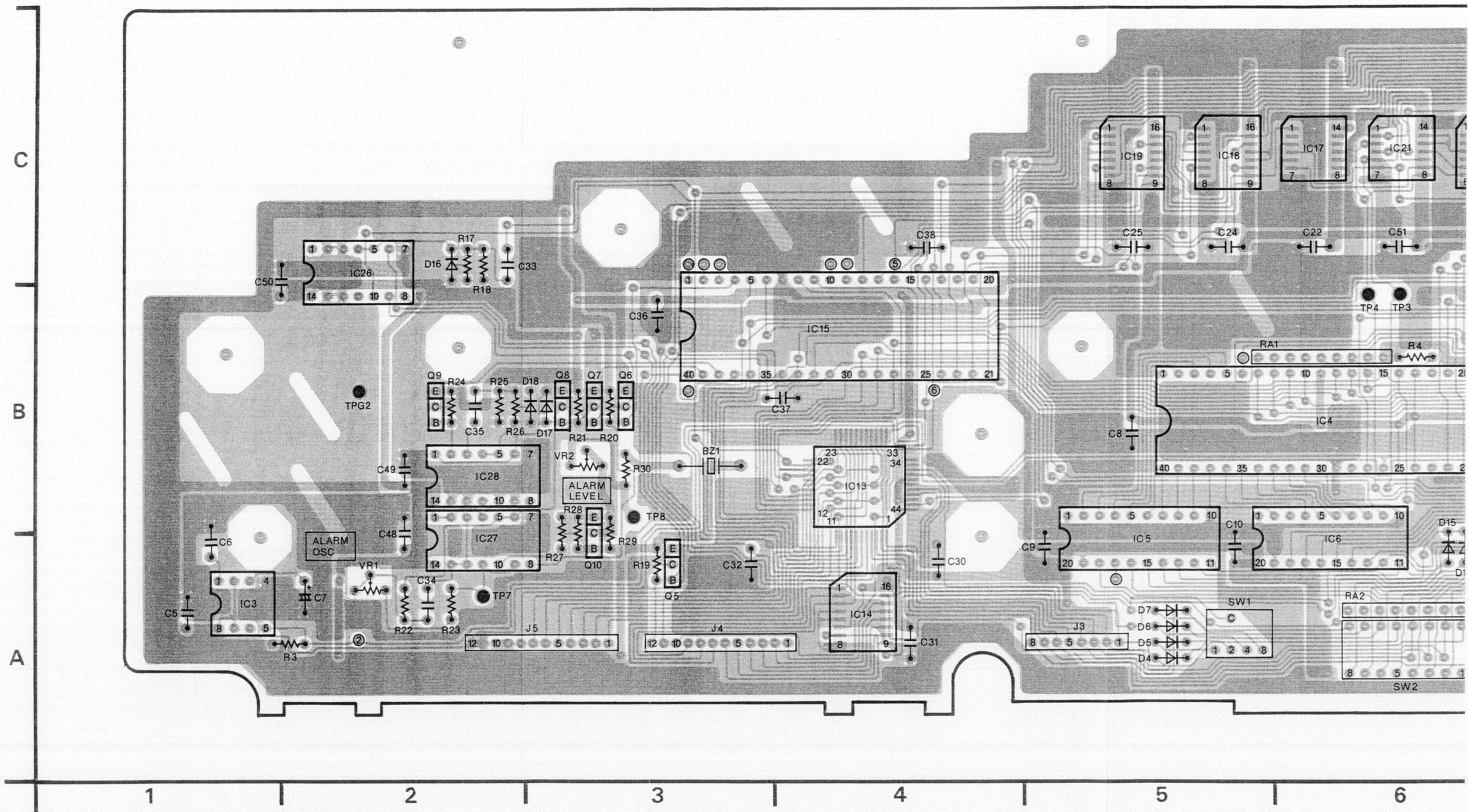
L6 SYSTEM CONTROL & TC SCHEMATIC DIAGRAM (4/4)





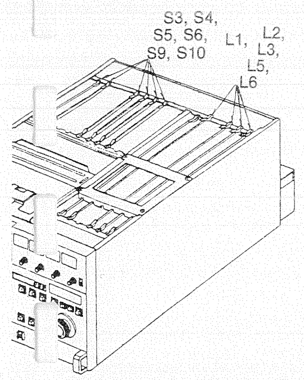
FRONT PANEL B P.C. BOARD (VEP86076B)



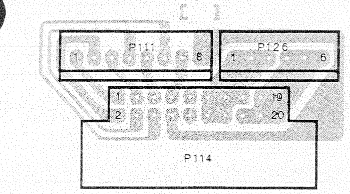


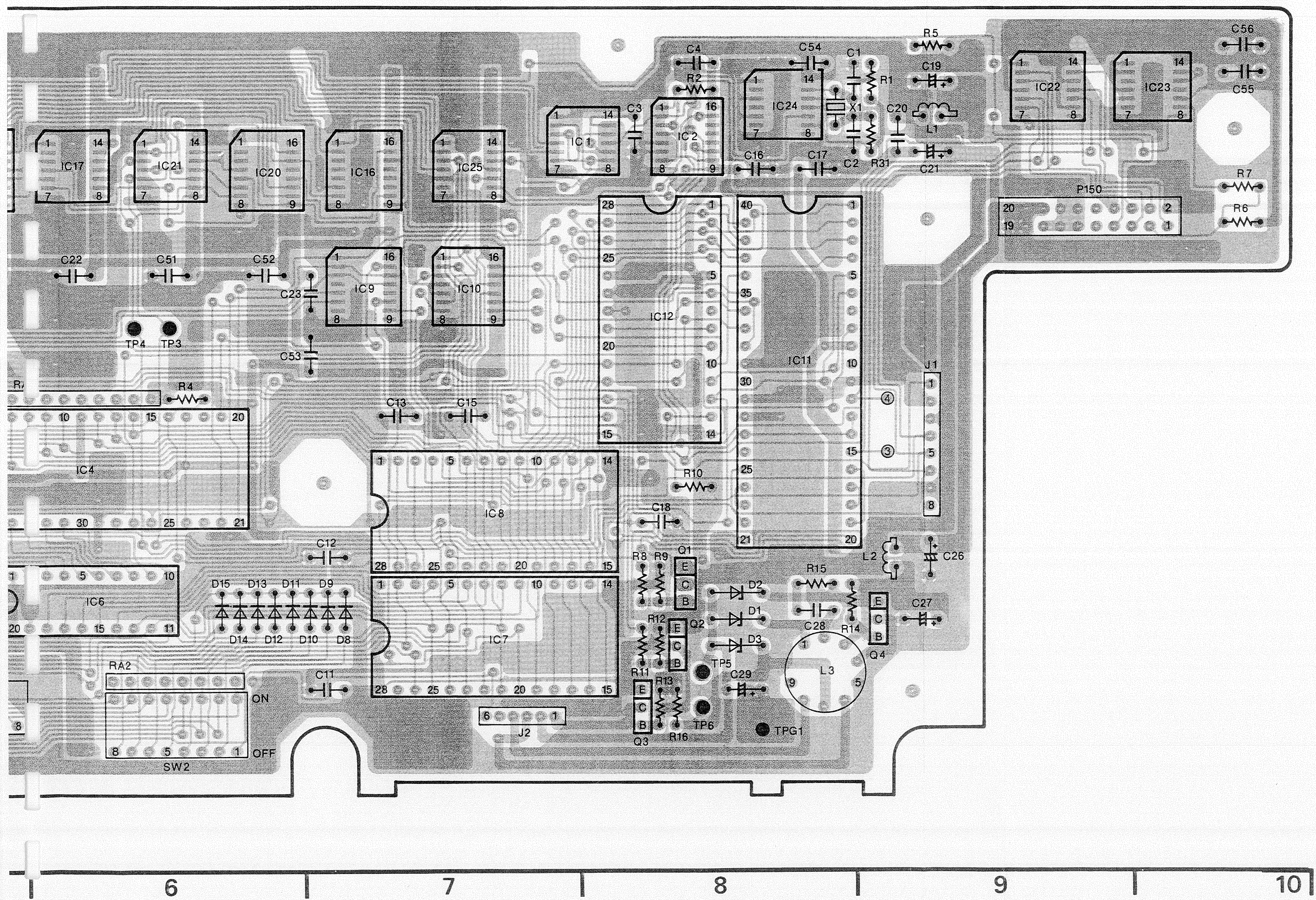
REVERSE SIDE

L6 SYSTEM CTL & TC
SCHEMATIC DIAGRAM (4/4)



FRONT PANEL CONNECTION P.C. BOARD (VEP80151A)

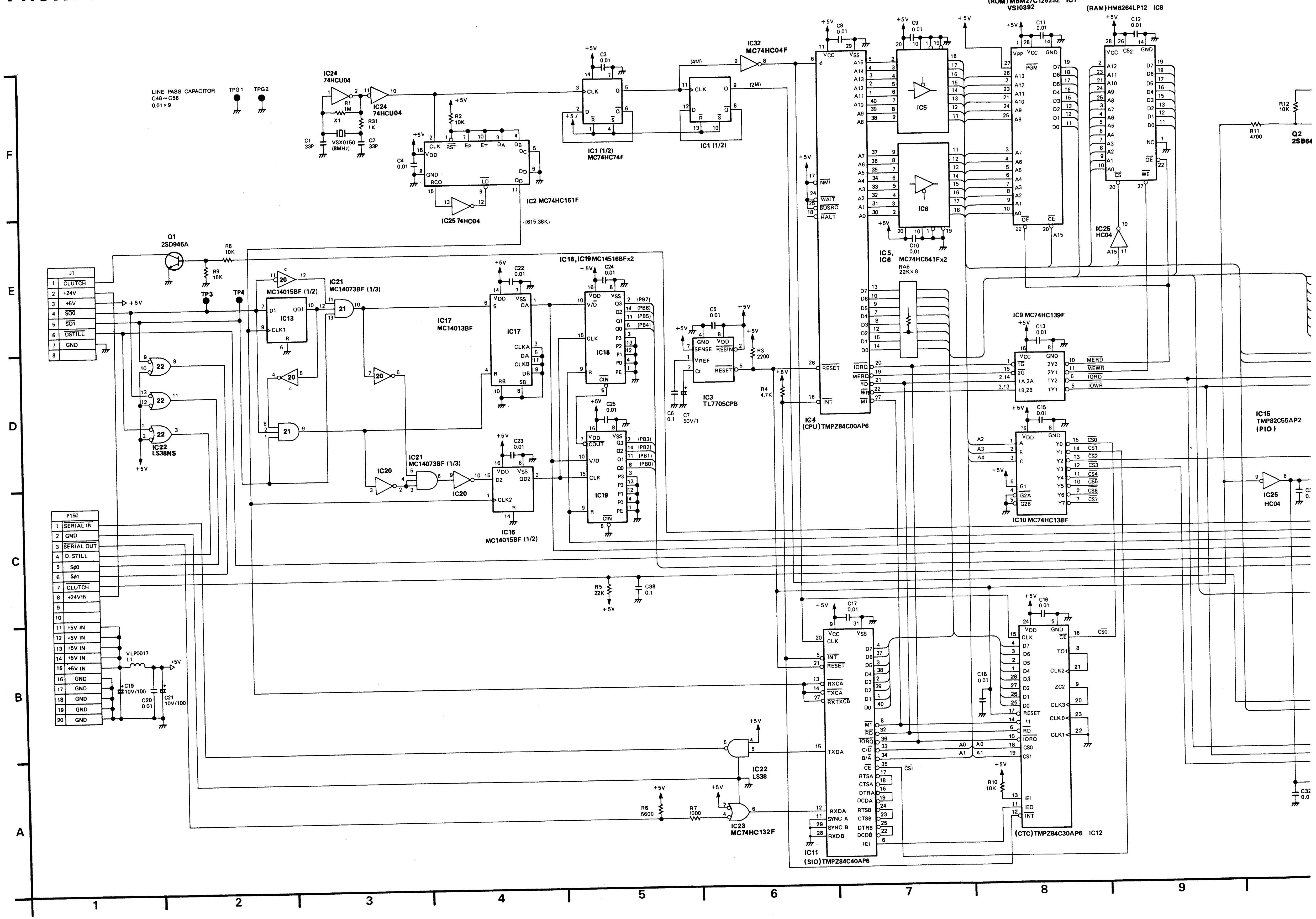


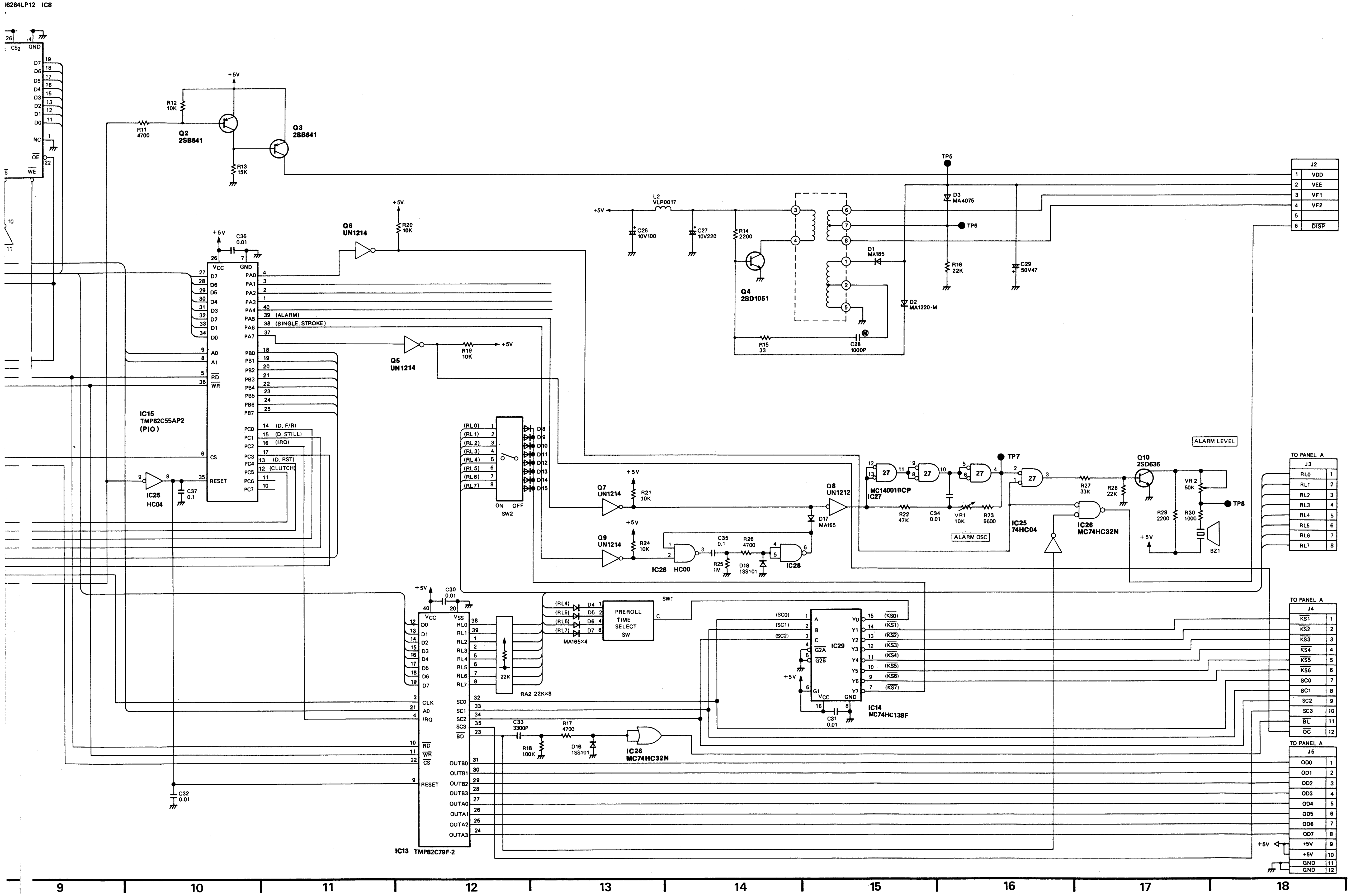


FRONT PANEL B	
Transistors	
Q1	B-8
Q2	A-8
Q3	A-8
Q4	A-9
Q5	A-3
Q6	B-3
Q7	B-3
Q8	B-3
Q9	B-2
Q10	A-3
Integrated Circuits	
IC1	C-8
IC2	C-8
IC3	A-1
IC4	B-6
IC5	A-5
IC6	A-6
IC7	A-7
IC8	B-7
IC9	C-7
IC10	C-7
IC11	B-8
IC12	B-8
IC13	B-4
IC14	A-4
IC15	B-4
IC16	C-7
IC17	C-6
IC18	C-5
IC19	C-5
IC20	C-6
IC21	C-6
IC22	C-9
IC23	C-10
IC24	C-8
IC25	C-7
IC26	C-2
IC27	A-2
IC28	B-2
Test Points	
TP3	B-6
TP4	B-6
TP5	A-8
TP6	A-8
TP7	A-2
TP8	A-3
TPG1	A-8
TPG2	B-2
Adjustments	
VR1	A-2
VR2	B-3

ADDRESS INFORMATION

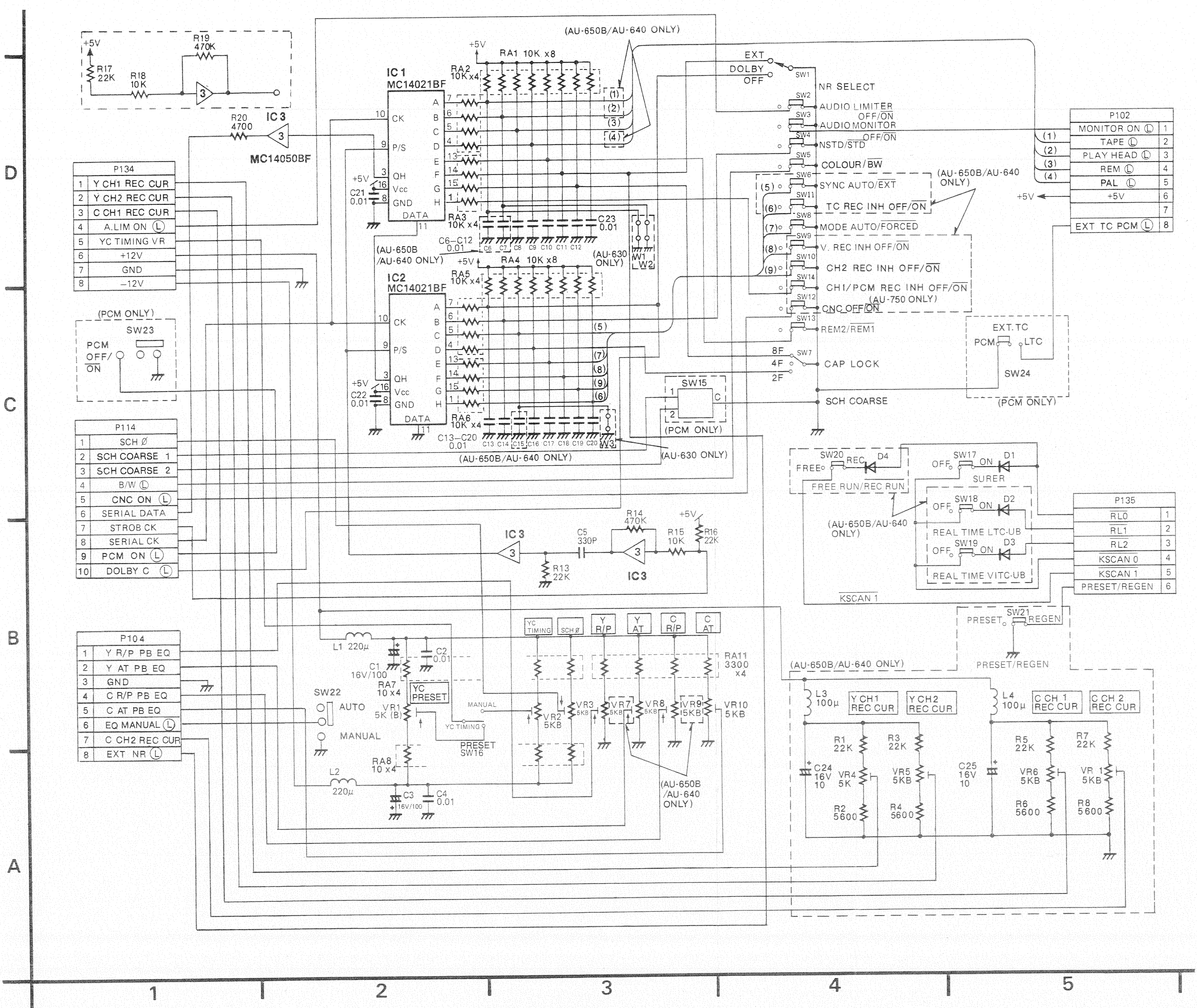
FRONT PANEL B SCHEMATIC DIAGRAM



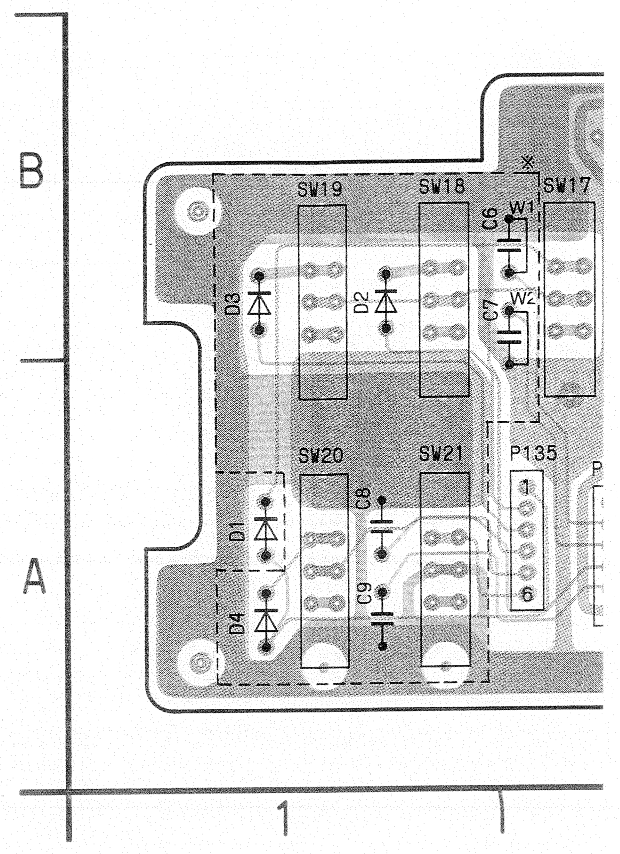


IC15 TMP82C55AP2 (PIO)
IC13 TMP82C79F-2
IC14 MC74HC138F
IC29
IC25 HC04
IC25 74HC04
IC26 MC74HC32N
IC27 MC14001BCP
IC28 HC00
Q2 2SB641
Q3 2SB641
Q4 2SD1051
Q5 UN1214
Q6 UN1214
Q7 UN1214
Q8 UN1212
Q9 UN1214
Q10 2SD636
PREROLL TIME SELECT SW
ALARM LEVEL
ALARM OSC
TO PANEL A
J2
J3
J4
J5
SW1
SW2
BZ1
TP5
TP6
TP7
TP8
9 10 11 12 13 14 15 16 17 18

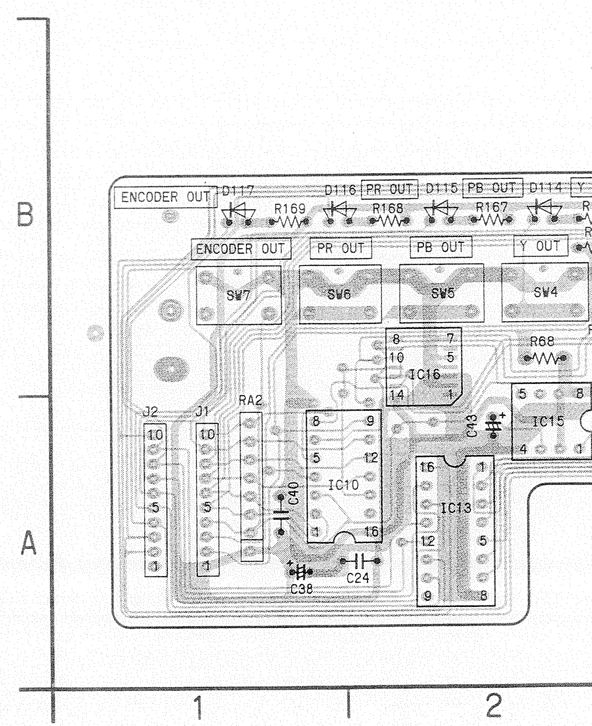
BACK PANEL SCHEMATIC DIAGRAM



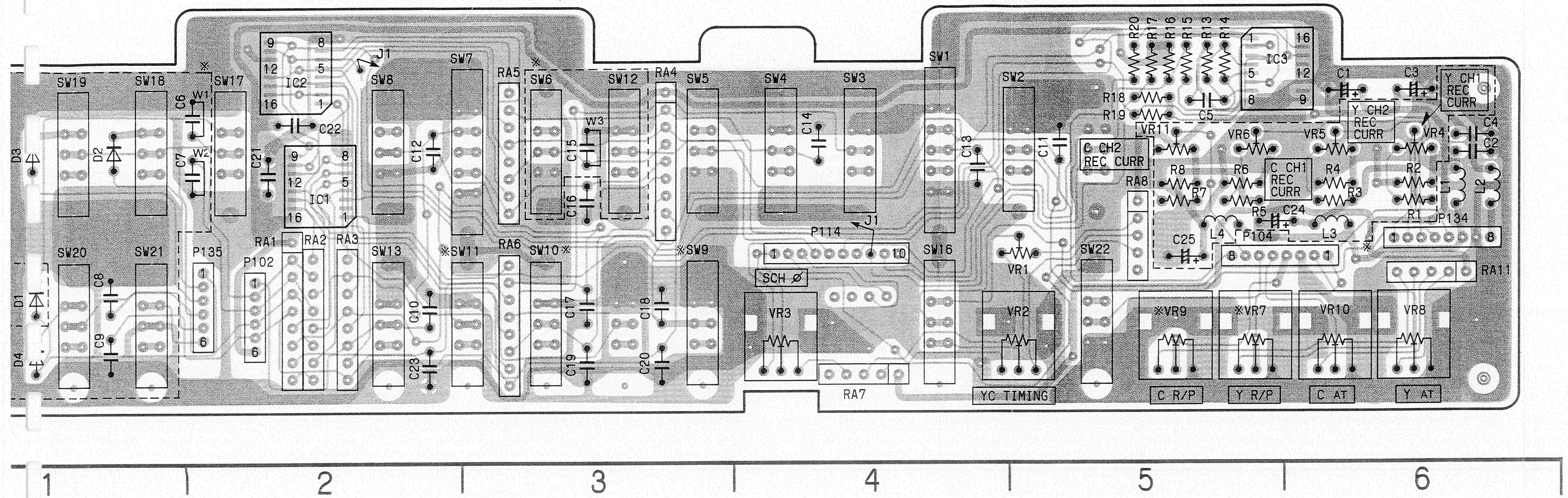
BACK PANEL P.C. BOARD (V



CONTROL VR P.C. BOARD (V



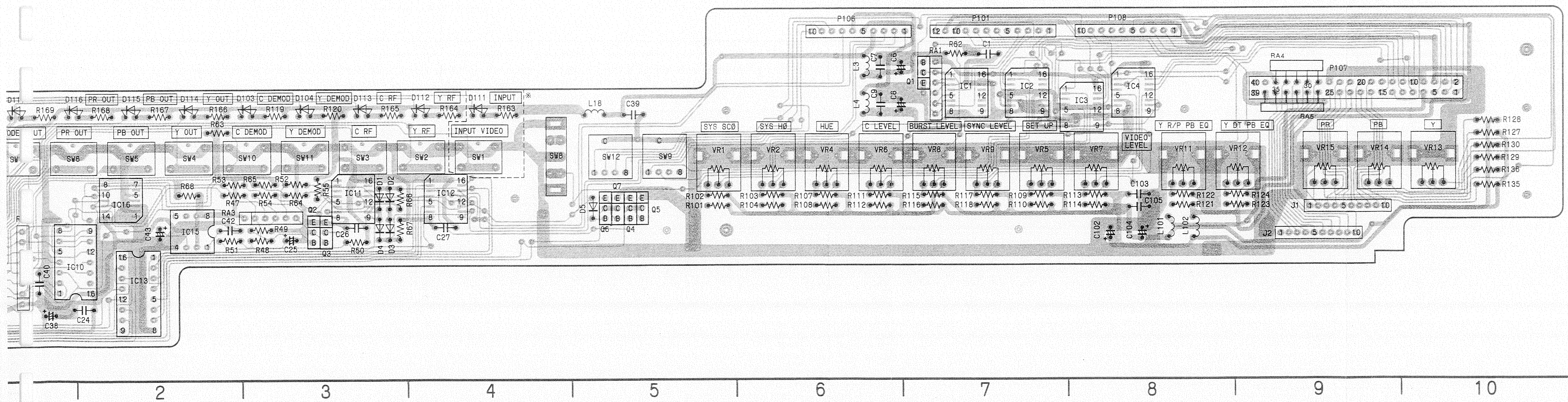
L P.C. BOARD (VEP80363B)



BACK PANEL	
Integrated Circuits	
IC1	A-2
IC2	B-2
IC3	B-5
Adjustments	
VR1	A-5
VR2	A-5
VR3	A-4
VR4	B-6
VR5	B-6
VR6	B-5
VR7	A-5
VR8	A-6
VR9	A-5
VR10	A-6
VR11	B-5

ADDRESS INFORMATION

R P.C. BOARD (VEP80410B)



CONTROL VR SCHEMATIC DIAGRAM

COMPARISON CHART

	BACK PANEL P.C.B.	
	AU-650B	AU-630
C6	0.01	—
C7	0.01	—
C15	0.01	—
C24	16V10	—
C25	16V10	—
D2	MA165	—
D3	MA165	—
D4	MA165	—
L3	100μ	—
L4	100μ	—
R1	22K	—
R2	5600	—
R3	22K	—
R4	5600	—
R5	22K	—
R6	5600	—
R7	22K	—
R8	5600	—
SW6	O	—
SW9	O	—
SW10	O	—
SW11	O	—
SW12	O	—
SW14	O	—
SW18	O	—
SW19	O	—
SW20	O	—
SW21	O	—
VR4	5KB	—
VR5	5KB	—
VR6	5KB	—
VR7	5KB	—
VR9	5KB	—
VR11	5KB	—
W1	—	O
W2	—	O
W3	—	O

O: PART IS MOUNTED
—: PART IS NOT MOUNTED

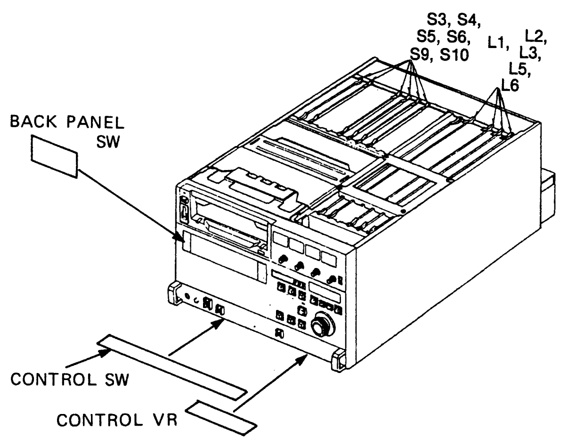
CONTROL VR	
Transistors	
Q1	B-7
Q2	A-3
Q3	A-3
Q4	A-5
Q5	A-5
Q6	A-5
Q7	A-5
Integrated Circuits	
IC1	B-7
IC2	B-7
IC3	B-8
IC4	B-8
IC10	A-1
IC11	B-3
IC12	B-4
IC13	A-2
IC15	A-2
IC16	B-2
Adjustments	
VR1	B-5
VR2	B-6
VR4	B-6
VR5	B-7
VR6	B-6
VR7	B-8
VR8	B-7
VR9	B-7
VR11	B-8
VR12	B-8
VR13	B-10
VR14	B-9
VR15	B-9

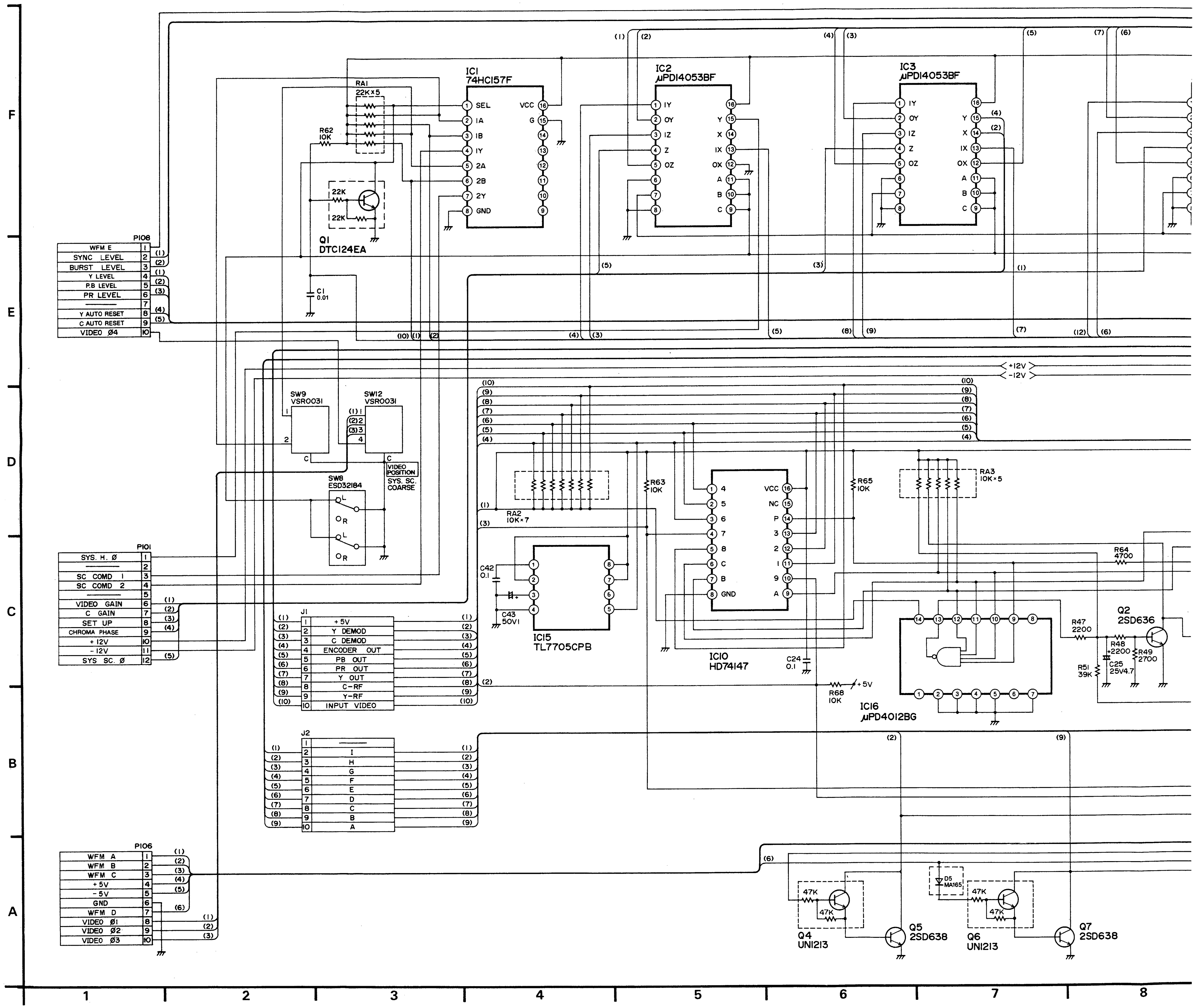
ADDRESS INFORMATION

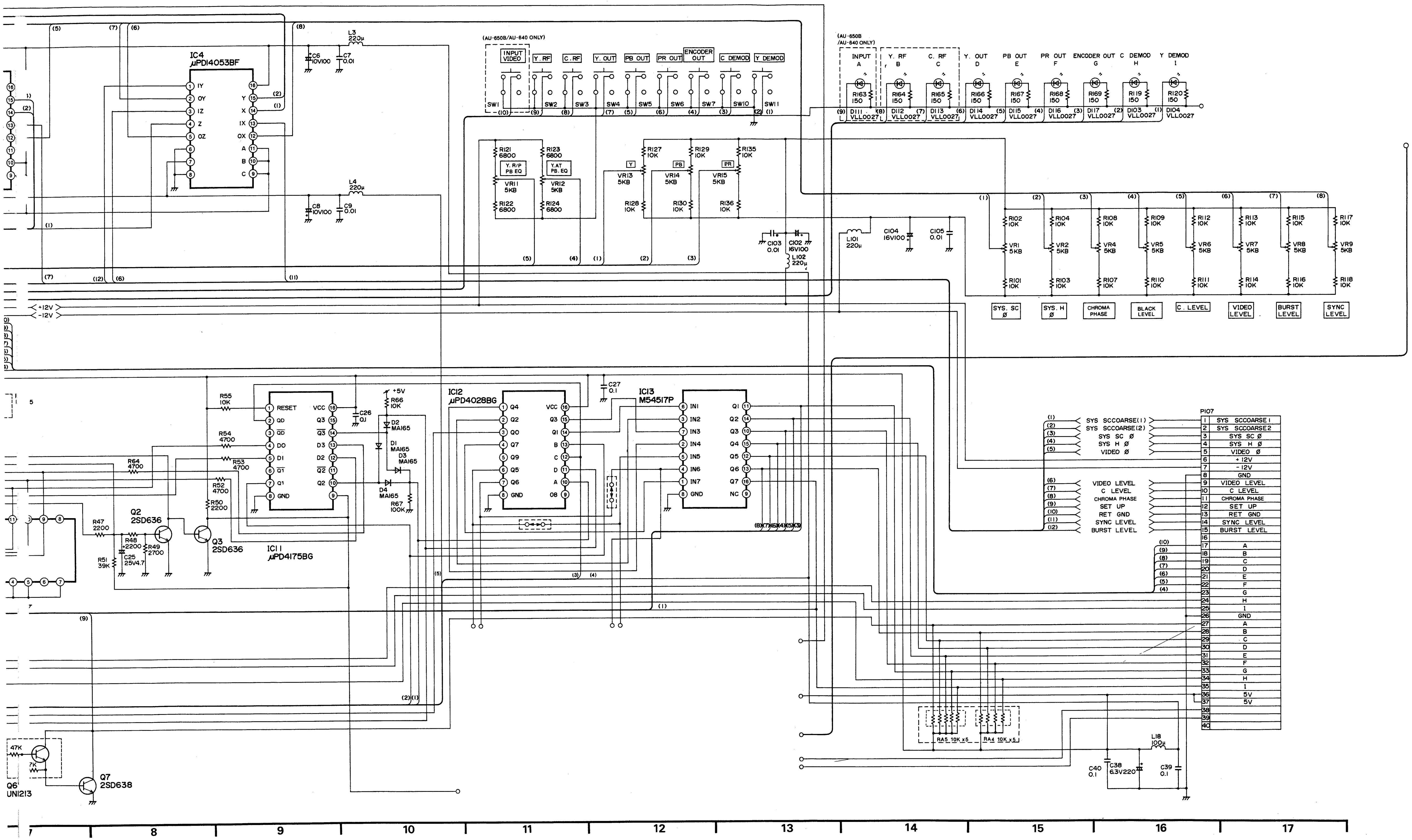
COMPARISON CHART

	CONTROL VR P.C.B.	
	AU-650B	AU-630
D111	VLL0027	—
R163	150	—
SW1	O	—

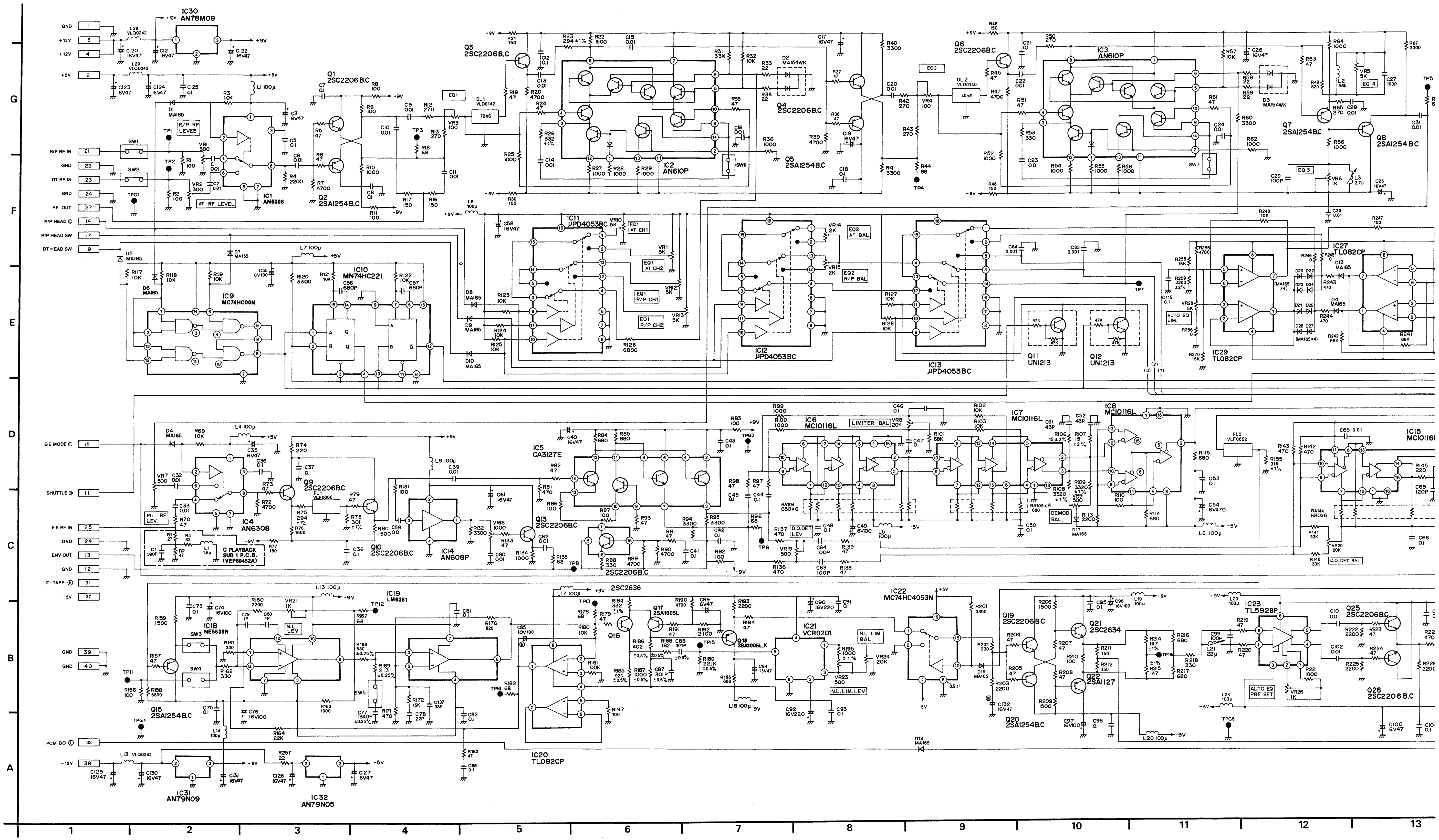
O: PART IS MOUNTED
—: PART IS NOT MOUNTED





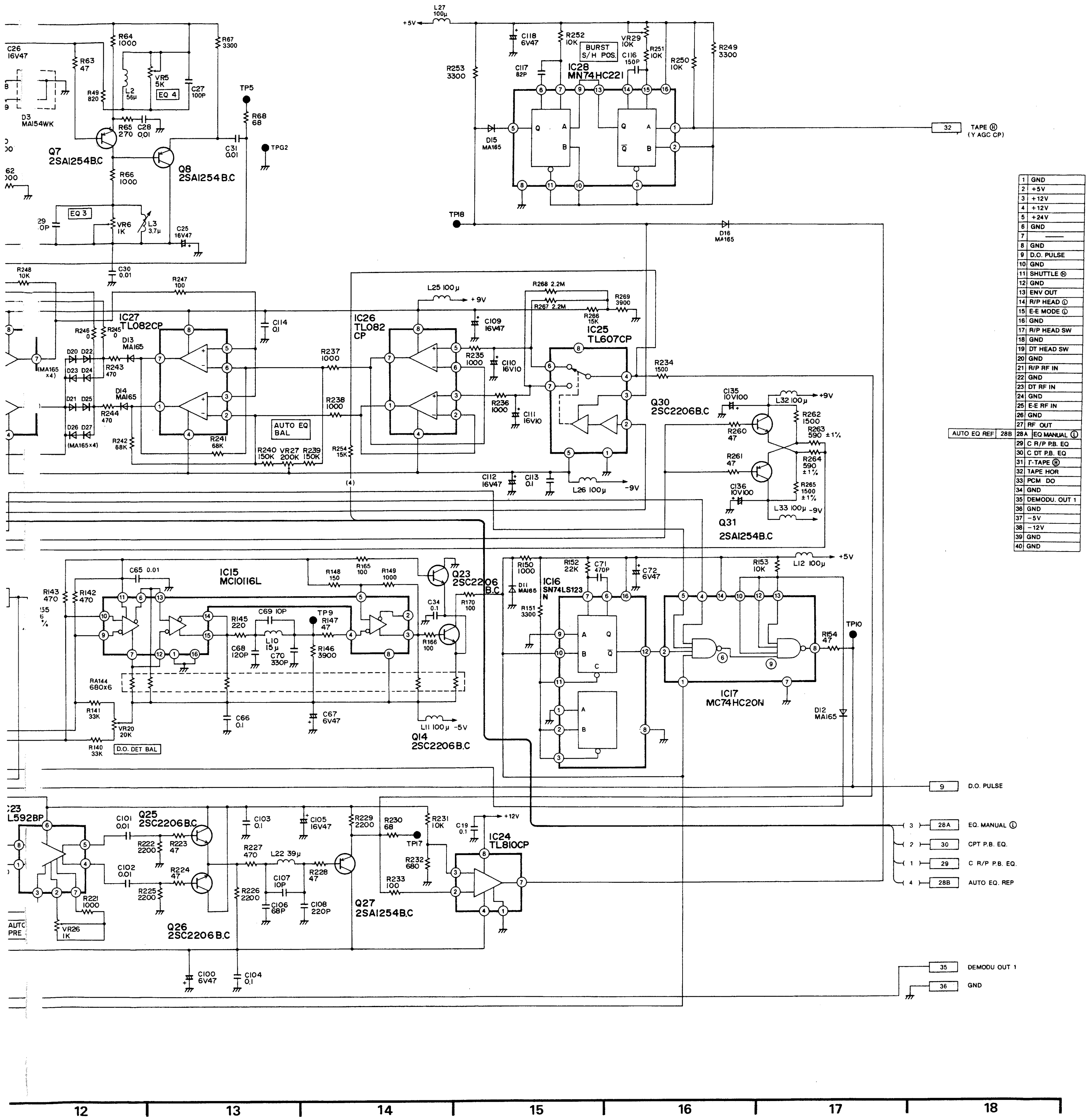

IC4
μPD14053BF
IC11
μPD4175BG
IC12
μPD4028BG
IC13
M54517P
Q2
2SD636
Q3
2SD636
Q7
2SD638
Q6
UN1213
(AU-650B/AU-640 ONLY)
INPUT VIDEO
Y. RF
C. RF
Y. OUT
PB OUT
PR OUT
ENCODER OUT
C. DEMOD
Y. DEMOD
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW10
SW11
Y. R/P PB EQ
Y. AT PB. EQ
L3 220μ
L4 220μ
C6 10V100
C7 0.01
C8 10V100
C9 0.01
R121 6800
R123 6800
VR11 5KB
VR12 5KB
R122 6800
R124 6800
VR13 5KB
VR14 5KB
VR15 5KB
R127 10K
R129 10K
R135 10K
R128 10K
R130 10K
R136 10K
C103 0.01
C102 16V100
L102 220μ
L101 220μ
C104 16V100
C105 0.01
INPUT A
Y. RF B
C. RF C
Y. OUT D
PB OUT E
PR OUT F
ENCODER OUT G
C DEMOD H
Y DEMOD I
D111 VLL0027
D112 VLL0027
D113 VLL0027
D114 VLL0027
D115 VLL0027
D116 VLL0027
D117 VLL0027
D103 VLL0027
D104 VLL0027
SYS. SC Ø
SYS. H Ø
CHROMA PHASE
BLACK LEVEL
C. LEVEL
VIDEO LEVEL
BURST LEVEL
SYNC LEVEL
+12V
-12V
+5V
R55 10K
R54 4700
R53 4700
R52 4700
R50 2200
R64 4700
R47 2200
R48 2200
R49 2700
R51 39K
C25 25V4.7
C26 0.1
C27 0.1
R66 10K
R67 100K
D1 MA165
D2 MA165
D3 MA165
D4 MA165
P107
SYS SCCOARSE(1)
SYS SCCOARSE(2)
SYS SC Ø
SYS H Ø
VIDEO Ø
VIDEO LEVEL
C LEVEL
CHROMA PHASE
SET UP
RET GND
SYNC LEVEL
BURST LEVEL
1 SYS SCCOARSE 1
2 SYS SCCOARSE 2
3 SYS SC Ø
4 SYS H Ø
5 VIDEO Ø
6 +12V
7 -12V
8 GND
9 VIDEO LEVEL
10 C LEVEL
11 CHROMA PHASE
12 SET UP
13 RET GND
14 SYNC LEVEL
15 BURST LEVEL
16
17 A
18 B
19 C
20 D
21 E
22 F
23 G
24 H
25 I
26 GND
27 A
28 B
29 C
30 D
31 E
32 F
33 G
34 H
35 I
36 5V
37 5V
38
39
40
RA5 10K x5
RA4 10K x5
L18 100μ
C40 0.1
C38 6.3V220
C39 0.1
8
9
10
11
12
13
14
15
16
17

S3 C PLAYBACK SCHEMATIC DIAGRAM



REVERSE SIDE

**CONTROL VR
SCHEMATIC DIAGRAM**



S-3	C PLAYBACK				
B		NO	A		
	—	1	GND	S4-1B	
POWER5-7	—	2	+5V	S4-2B	
	—	3	+12V	S4-3B	
	—	4	+12V	S4-4B	
		5	+24V	S4-5B	
	—	6	GND		
		7			
	—	8	GND		
S5-24B	—	9	C DO PULSE	P57-1	S9-35B
	—	10	GND	P57-2	
	—	11	SHUTTLE Ⓗ	P78-3	
	—	12	GND	P57-5	
	—	13	C ENV OUT	P57-6	
	—	14	GND		
		15			
	—	16	GND	S5-19A	
	—	17	C HEAD SW	S5-19B	
		18			
		19			
	—	20	GND	S5-21A	
	—	21	C RF IN	S5-21B	
		22			
		23			
		24			
		25			
		26			
		27			
P65-7	C AUTO EQ REF	28	EQ MANUAL Ⓛ	P87-6	S4-11A
		29	C PB EQ	P87-4, 5	
		30			
		31			
	—	32	C CP	P78-9	
		33			
		34	GND		
	—	35	C DEMOD OUT	P59-6	
	—	36	GND	P59-5	
	—	37	−5V	S4-37B	
POWER5-1	—	38	−12V	S4-38B	
	—	39	GND	S4-39B	
	—	40	GND	S4-40B	

To LØ

P57			
S3−9	1	C DO PULSE	P26−3
S3−10	2	GND	P26−4
S4−9	3	Y DO PULSE	P26−1
S4−10	4	GND	P26−2
S3−12	5	GND	P18−4
S3−13	6	C ENV OUT	P18−3
S4−12	7	GND	P18−2
S4−13	8	Y ENV OUT	P18−1

To L0

P78			
S4-29	1	FWD SEARCH Ⓗ	P35-2
S4-30	2	REW SEARCH Ⓗ	P35-3
S3-11	3	SHUTTLE Ⓗ	P35-5
S6-21B	4	$\overline{\text{LOADING MUT}}$	P35-9
	5		
S10-18B	6	T BRK SOL Ⓗ	P35-6
P72-2	7	FAN STOP Ⓛ	P35-10
S4-32	8	Y AGC CP	P26-5
S3-32	9	C CP	P26-6
S6-15A	10	CUE Ⓗ	P32-3

To L0

P59			
	1		
S6-22B	2	NR ON Ⓛ	P32-10
	3		
	4		
S3-36	5	GND	P25-1
S3-35	6	C DEMOD OUT 1	P25-2
S4-36	7	GND	P25-3
S4-35	8	Y DEMOD OUT 1	P25-4

To BACK PANEL SW

P87			
S4-27	1	Y PB EQ	P104-1
S4-27	2	Y PB EQ	P104-2
S4-26	3	GND	P104-3
S3-29A	4	C PB EQ	P104-4
S3-29A	5	C PB EQ	P104-5
S3-28A	6	EQ MANUAL Ⓛ	P104-6
	7		
S6-34A	8	EXT NR Ⓛ	P104-8

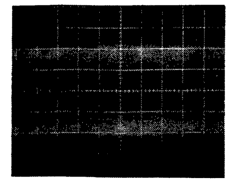
To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

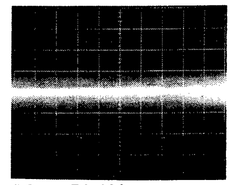
P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	−5V	P106-5
S10-37	4	−12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	−12V	P151-2

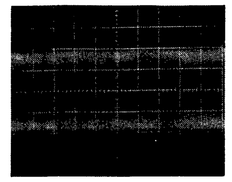
To L0

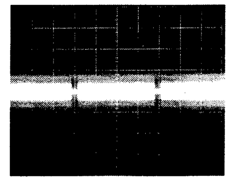
POWER 5			
S3-38B	1	−12V	POWER2-1
S10-36AB	2	−5V	POWER2-2
	3	GND	POWER2-3
	4	GND	POWER2-4
S10-4B	5	+12V	POWER2-5
	6		
S3-2B	7	+15V	POWER2-7

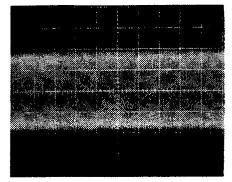
S3 C PLAYBACK WAVEFORMS

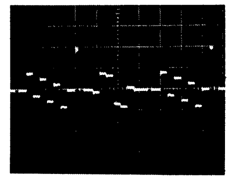

TP1 PLAY
0.1V/5msec. div.

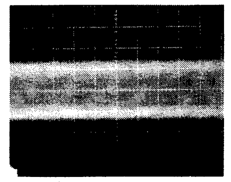

TP10 PLAY
2V/5msec. div.

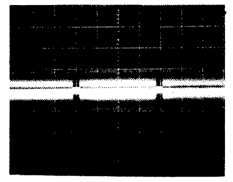

TP2 PLAY
0.1V/5msec. div.

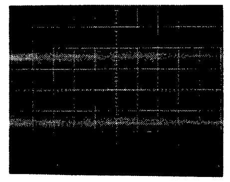

TP12 PLAY
0.5V/5msec. div.

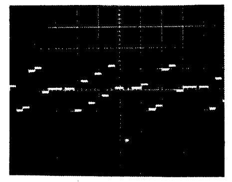

TP3 PLAY
0.1V/20μsec. div.

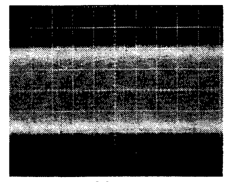

TP13 PLAY
0.5V/10μsec. div.

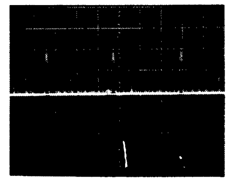

TP4 PLAY
0.1V/20μsec. div.


TP15 PLAY
0.2V/5msec. div.


TP5 PLAY
0.2V/20μsec. div.


TP16 PLAY
0.5V/10μsec. div.

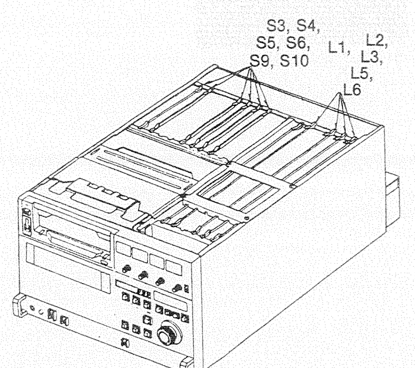

TP6 PLAY
0.1V/20μsec. div.

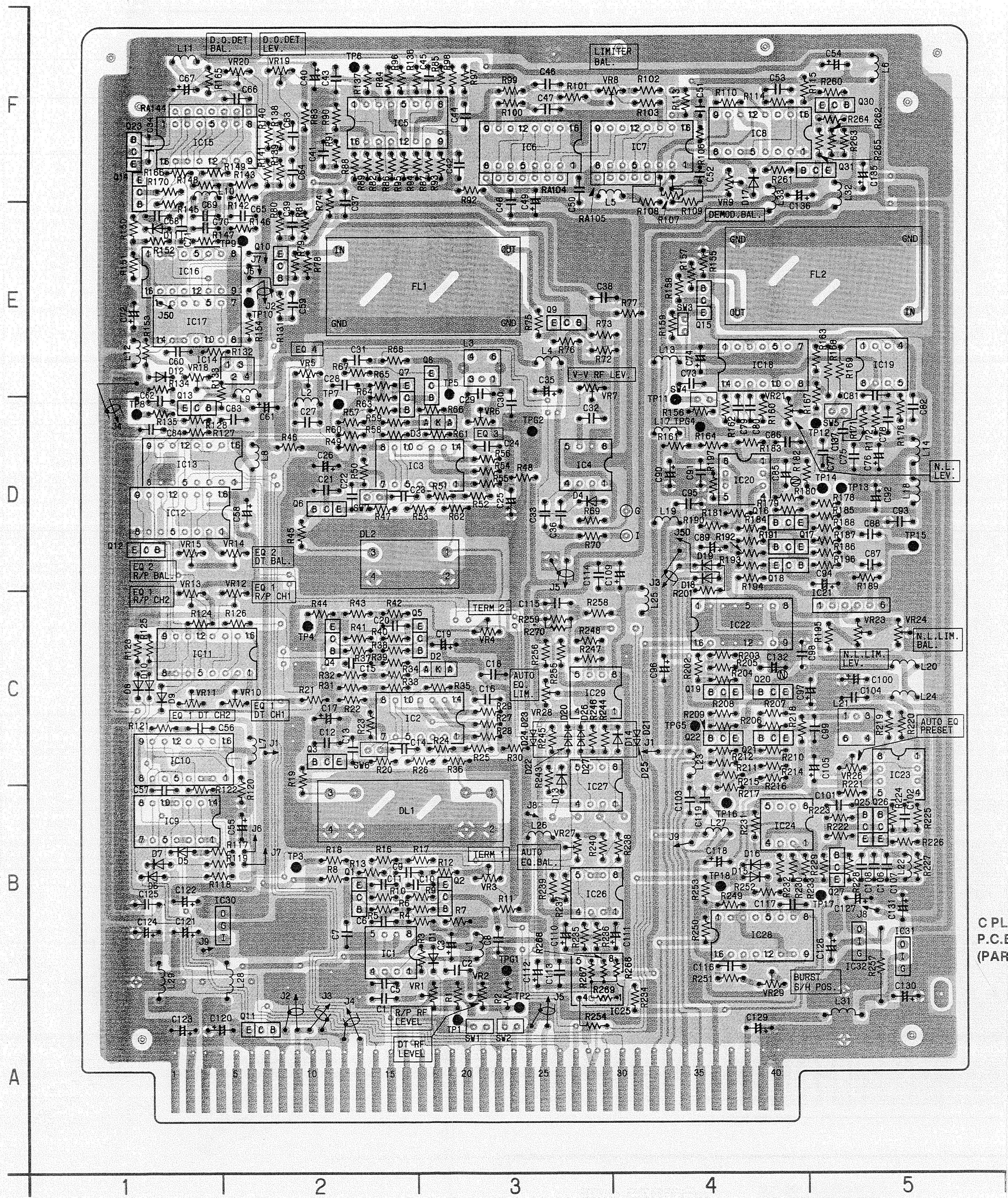

TP17 PLAY
0.5V/10μsec. div.

S3 C PLAYBACK P.C. BOARD (VEP88037A)

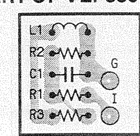
C PB (S3)	
Transistors	
Q1	B-2
Q2	B-3
Q3	C-2
Q4	C-2
Q5	C-3
Q6	D-2
Q7	E-2
Q8	E-3
Q9	E-3
Q10	E-2
Q11	A-2
Q12	D-1
Q13	D-1
Q14	F-1
Q15	E-4
Q16	D-4
Q17	D-4
Q18	D-4
Q19	C-4
Q20	C-4
Q21	C-4
Q22	C-4
Q23	F-1
Q25	B-5
Q26	B-5
Q27	B-5
Q30	F-5
Q31	F-5
Integrated Circuits	
IC1	B-2
IC2	C-3
IC3	D-3
IC4	D-3
IC5	F-2
IC6	F-3
IC7	F-4
IC8	F-4
IC9	B-1
IC10	C-1
IC11	C-1
IC12	D-1
IC13	D-1
IC14	E-2
IC15	F-1
IC16	E-1
IC17	E-1
IC18	E-4
IC19	E-5
IC20	D-4
IC21	C-5
IC22	C-4
IC23	C-5
IC24	B-4
IC25	B-3
IC26	B-3
IC27	C-3
IC28	B-4
IC29	C-3
IC30	B-1
IC31	B-5
IC32	B-5
Test Points	
TP1	A-3
TP2	A-3
TP3	B-2
TP4	C-2
TP5	E-3
TP6	F-2
TP7	D-2
TP8	D-1
TP9	E-2
TP10	E-2
TP11	D-4
TP12	D-4
TP13	D-4
TP14	D-4
TP15	D-4
TP16	B-4
TP17	B-5
TP18	B-4
TPG1	B-3
TPG2	D-3
TPG4	D-4
TPG5	C-4
Adjustments	
VR1	A-3
VR2	A-3
VR3	B-3
VR4	C-3
VR5	E-2
VR6	D-3
VR7	E-3
VR8	F-3
VR9	F-4
VR10	C-2
VR11	C-1
VR12	D-2
VR13	D-1
VR14	D-2
VR15	D-1
VR18	E-1
VR19	F-2
VR20	F-2
VR21	D-4
VR23	C-5
VR24	C-5
VR26	C-5
VR27	B-3
VR28	C-3
VR29	A-4

ADDRESS INFORMATION



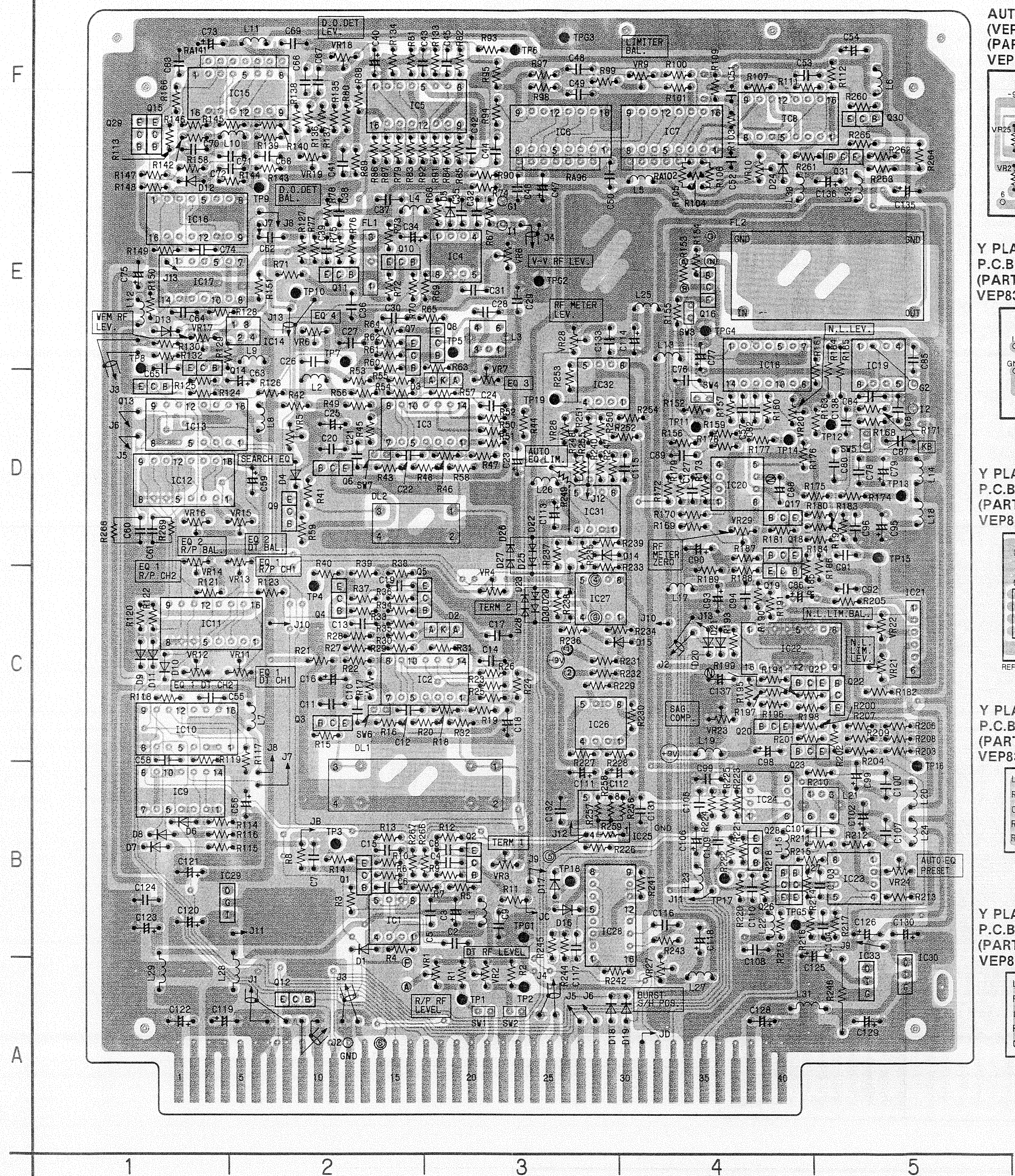


C PLAYBACK SUB (1)
P.C.B. (VEP80452A)
(PART OF VEP88037A)



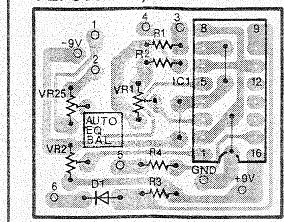
4—55

S4 Y PLAYBACK P.C. BOARD (VEP83063B)

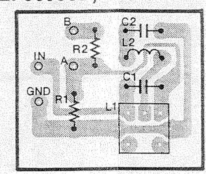


REVERSE SIDE

AUTO EQ SUB P.C.B. (VEP80501A) (PART OF VEP83063A/ VEP83063B)

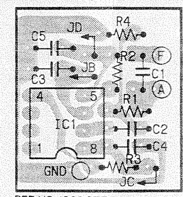


Y PLAYBACK SUB (4) P.C.B. (VEP80491A) (PART OF VEP83063A/ VEP83063B)



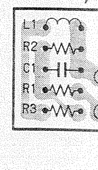
REF. NO. 2000 SERIES

Y PLAYBACK SUB (1) P.C.B. (VEP80442A) (PART OF VEP83063A/ VEP83063B)

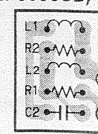


REF. NO. 1000 SERIES

Y PLAYBACK SUB (2) P.C.B (VEP80451A) (PART OF VEP83063A/ VEP83063B)



Y PLAYBACK SUB (3) P.C.B (VEP80453A) (PART OF VEP83063A/ VEP83063B)



Y PB (S4)

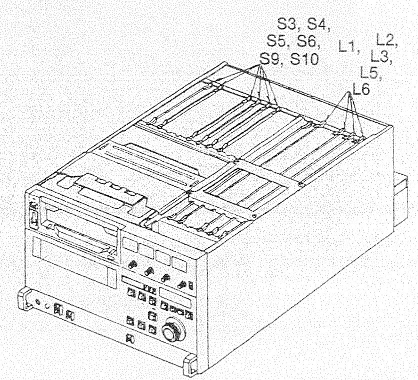
Transistors	
Q1	B-2
Q2	B-2
Q3	C-2
Q4	C-2
Q5	C-3
Q6	D-2
Q7	E-2
Q8	E-3
Q9	D-2
Q10	E-2
Q11	E-2
Q12	A-2
Q13	D-1
Q14	D-1
Q15	F-1
Q16	F-4
Q17	D-4
Q18	D-4
Q19	C-4
Q20	C-4
Q21	C-5
Q22	C-5
Q23	C-4
Q26	B-4
Q27	B-4
Q28	B-4
Q29	F-1
Q30	F-5
Q31	F-5

Integrated Circuits	
IC1	B-2
IC2	C-3
IC3	D-3
IC4	E-3
IC5	F-2
IC6	F-3
IC7	F-4
IC8	F-4
IC9	B-1
IC10	C-1
IC11	C-1
IC12	D-1
IC13	D-1
IC14	E-2
IC15	F-2
IC16	E-1
IC17	E-1
IC18	E-4
IC19	E-5
IC20	D-4
IC21	C-5
IC22	C-4
IC23	B-5
IC24	B-4
IC25	B-3
IC26	C-3
IC27	C-3
IC28	B-3
IC29	B-2
IC30	A-5
IC31	D-3
IC32	D-3
IC33	A-5

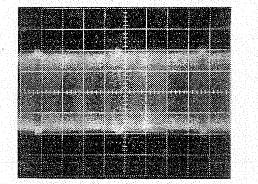
Test Points	
TP1	A-3
TP2	A-3
TP3	B-2
TP4	C-2
TP5	E-3
TP6	F-3
TP7	E-2
TP8	E-1
TP9	E-2
TP10	E-2
TP11	D-4
TP12	D-5
TP13	D-5
TP14	D-4
TP15	D-5
TP16	B-5
TP17	B-4
TP18	B-3
TP19	D-3
TPG1	B-3
TPG2	E-3
TPG3	F-3
TPG4	E-4
TPG5	B-4

Adjustments	
VR1	A-3
VR2	A-3
VR3	B-3
VR4	C-3
VR5	D-2
VR6	F-3
VR7	D-3
VR8	E-3
VR9	F-4
VR10	F-4
VR11	C-2
VR12	C-1
VR13	C-2
VR14	C-1
VR15	D-2
VR16	D-1
VR17	E-1
VR18	F-2
VR19	F-2
VR20	D-4
VR21	C-5
VR22	C-5
VR23	C-4
VR24	B-5
VR25	C-3
VR26	D-3
VR27	A-4
VR28	E-3
VR29	D-4
C87	D-5

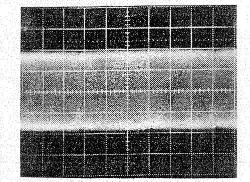
ADDRESS INFORMATION



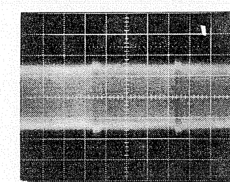
S4 Y PLAYBACK WAVEFORMS



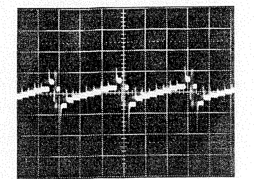
TP1 PLAY
100mV/5msec. div.



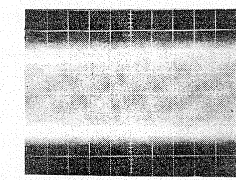
TP8 PLAY
100mV/20μsec. div.



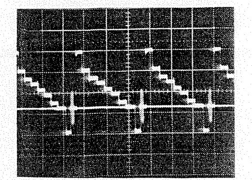
TP2 PLAY
100mV/5msec. div.



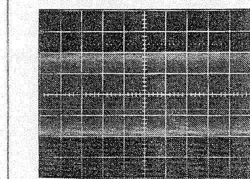
TP12 PLAY
0.5V/20μsec. div.



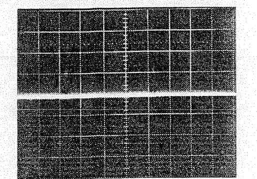
TP3 PLAY
50mV/20μsec. div.



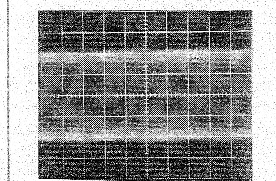
TP16 PLAY
0.5V/20μsec. div.



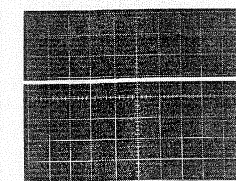
TP5 PLAY
100mV/20μsec. div.



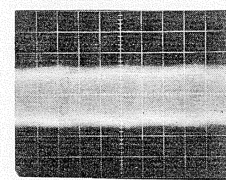
TP17 PLAY
0.5V/5msec. div.



TP6 PLAY
100mV/20μsec. div.



TP18 PLAY
100mV/5msec. div.

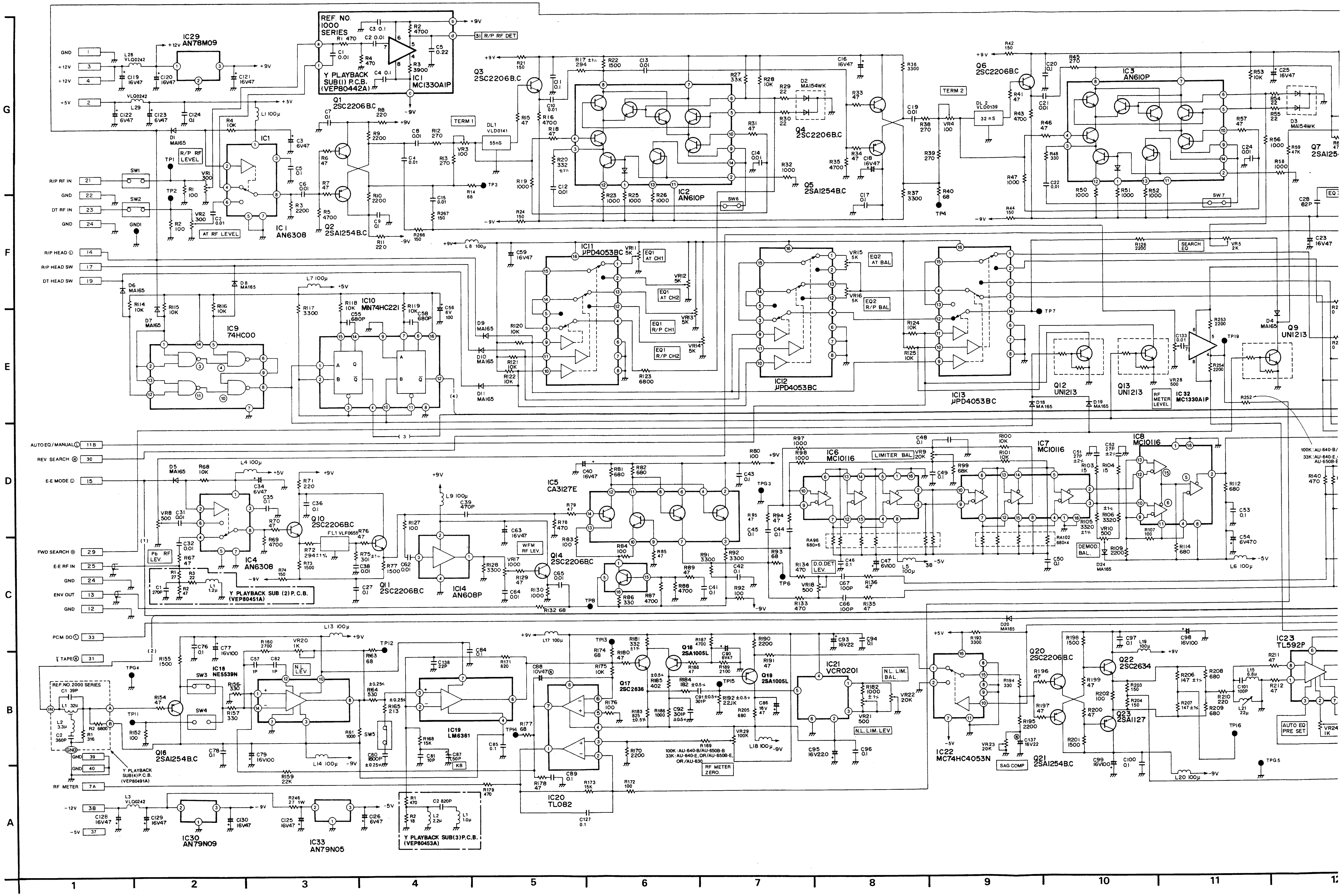


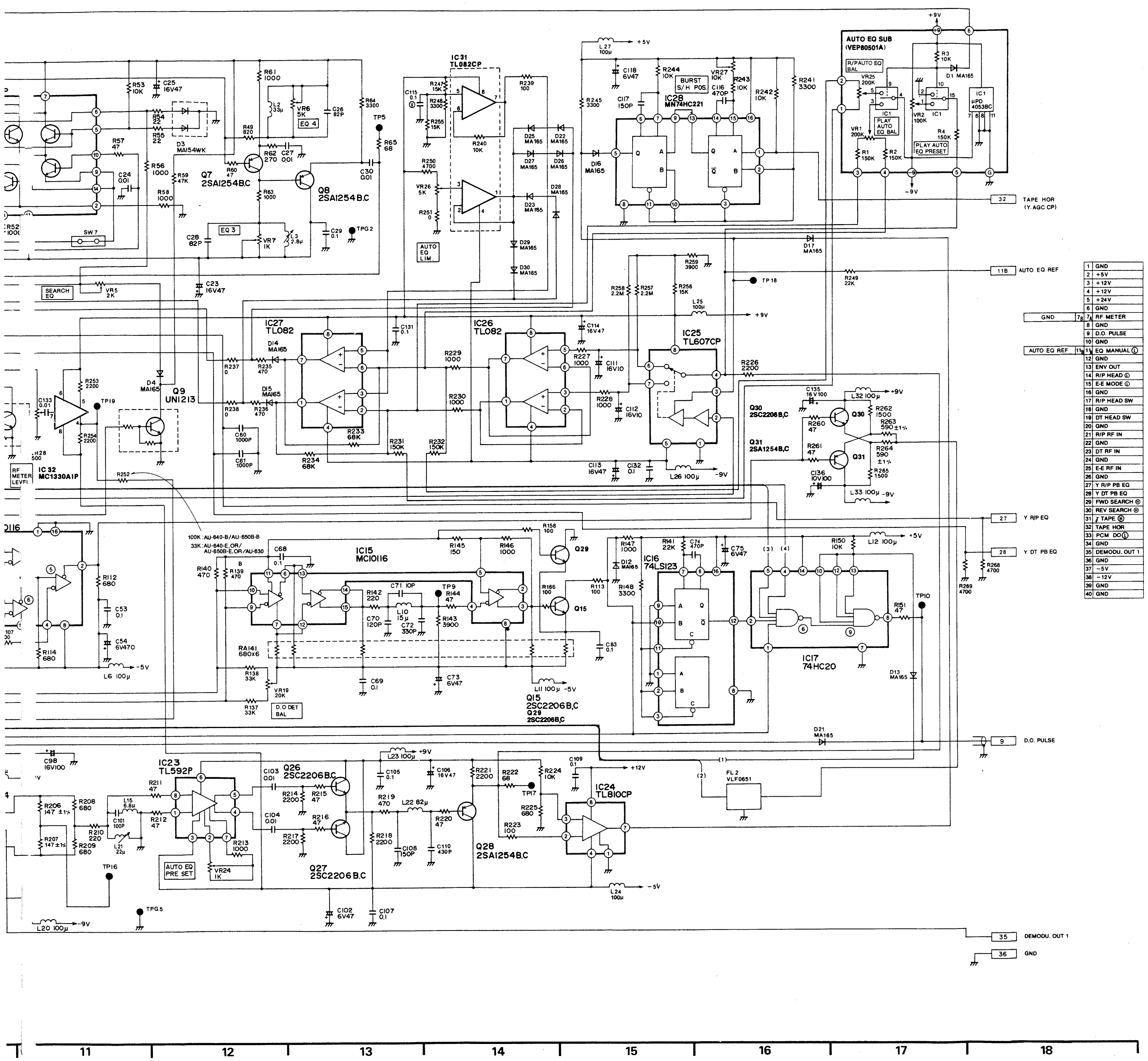
TP7 PLAY
50mV/20μsec. div.

S3 C PLAYBACK P.C.B.

4—56

S4 Y PLAYBACK SCHEMATIC DIAGRAM





S-4		Y PLAYBACK			
B		NO	A		
S3-1A	—	1	GND	S5-1B	
S3-2A	—	2	+5V	S5-2B	
S3-3A	—	3	+12V	S5-3B	
S3-4A	—	4	+12V	S5-4B	
S3-5A	—	5	+24V	S5-5B	
	GND	6	GND		
	—	7	Y RF METER	S9-32A	S5-12B
	—	8	GND		
	—	9	Y DO PULSE	P57-3	S9-35A
	—	10	GND	P57-4	
P65-6	Y AUTO EQ REF	11	EQ MANUAL Ⓛ	S3-28A	
	—	12	GND	P57-7	
	—	13	Y ENV OUT	P57-8	
	—	14	GND		
		15			
	—	16	GND	S5-10A	
	—	17	Y HEAD SW	S5-10B	
		18			
		19			
	—	20	GND	S5-6A	
	—	21	Y RF IN	S5-6B	
		22			
		23			
		24			
		25			
	—	26	GND	P87-3	
	—	27	Y PB EQ	P87-1, 2	
		28			
	—	29	FWD SEARCH Ⓗ	P78-1	
	—	30	REV SEARCH Ⓗ	P78-2	
		31			
	—	32	Y AGC CP	P78-8	
		33			
		34			
P59-8	—	35	Y DEMOD OUT 1		
P59-7	—	36	GND		
S3-37A	—	37	−5V	S5-37B	
S3-38A	—	38	−12V	S5-38B	
S3-39A	—	39	GND	S5-39B	
S3-40A	—	40	GND	S5-40B	

To LØ

P57			
S3−9	1	C DO PULSE	P26−3
S3−10	2	GND	P26−4
S4−9	3	Y DO PULSE	P26−1
S4−10	4	GND	P26−2
S3−12	5	GND	P18−4
S3−13	6	C ENV OUT	P18−3
S4−12	7	GND	P18−2
S4−13	8	Y ENV OUT	P18−1

To L0

P78			
S4-29	1	FWD SEARCH Ⓗ	P35-2
S4-30	2	REW SEARCH Ⓗ	P35-3
S3-11	3	SHUTTLE Ⓗ	P35-5
S6-21B	4	$\overline{\text{LOADING MUT}}$	P35-9
	5		
S10-18B	6	T BRK SOL Ⓗ	P35-6
P72-2	7	FAN STOP Ⓛ	P35-10
S4-32	8	Y AGC CP	P26-5
S3-32	9	C CP	P26-6
S6-15A	10	CUE Ⓗ	P32-3

To L0

P59			
	1		
S6-22B	2	NR ON Ⓛ	P32-10
	3		
	4		
S3-36	5	GND	P25-1
S3-35	6	C DEMOD OUT 1	P25-2
S4-36	7	GND	P25-3
S4-35	8	Y DEMOD OUT 1	P25-4

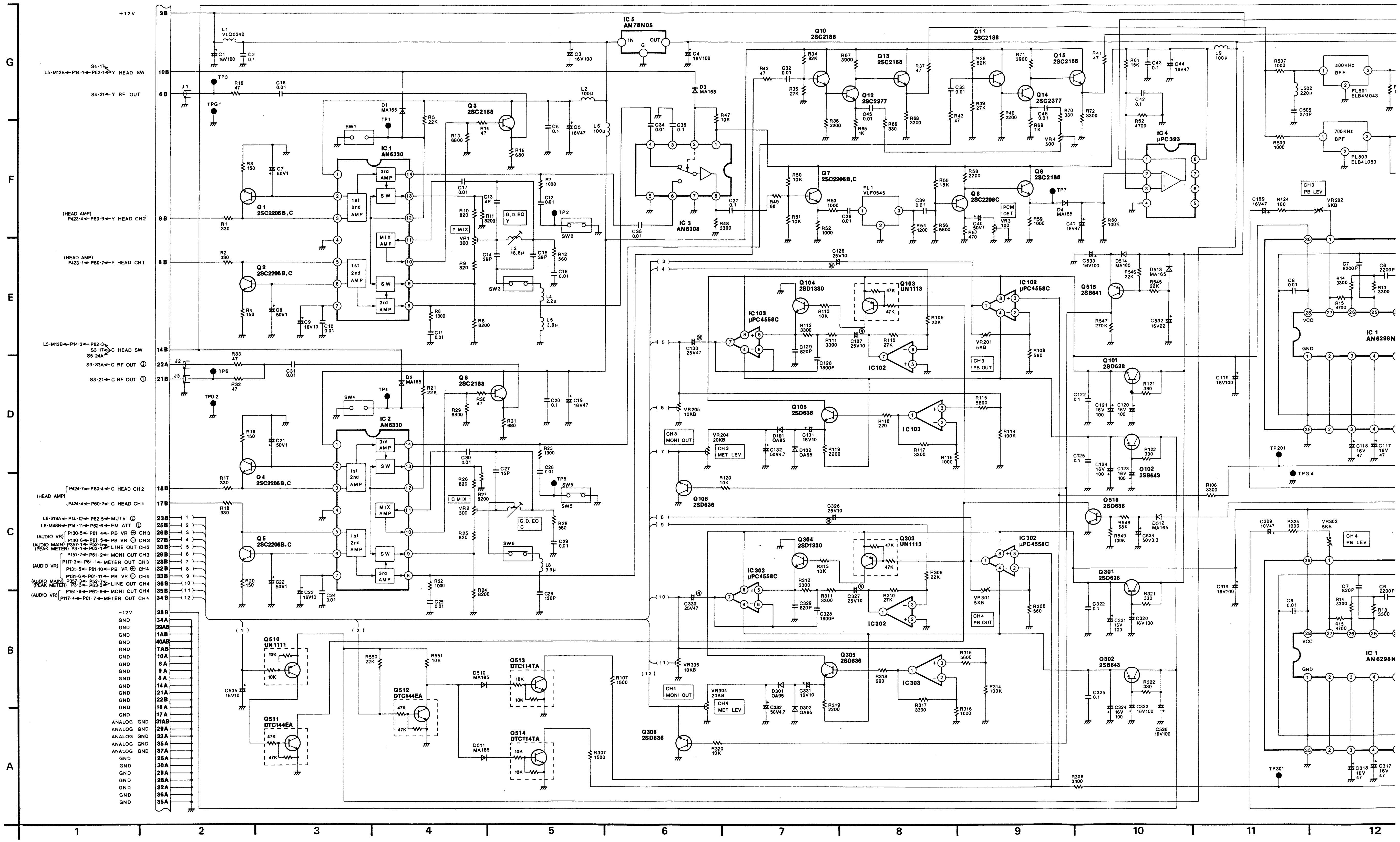
To BACK PANEL SW

P87			
S4-27	1	Y PB EQ	P104-1
S4-27	2	Y PB EQ	P104-2
S4-26	3	GND	P104-3
S3-29A	4	C PB EQ	P104-4
S3-29A	5	C PB EQ	P104-5
S3-28A	6	EQ MANUAL Ⓛ	P104-6
	7		
S6-34A	8	EXT NR Ⓛ	P104-8

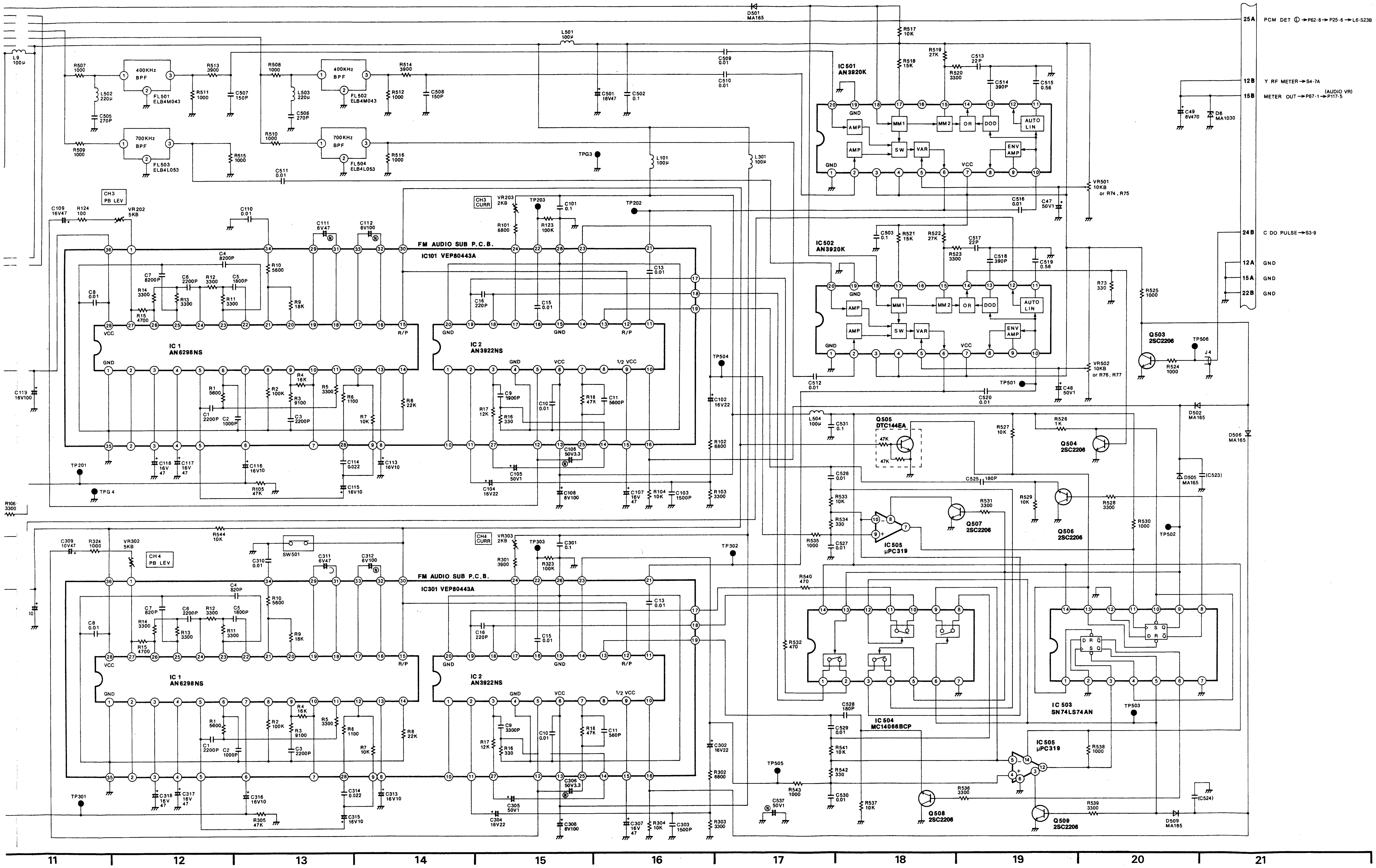
To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	−5V	P106-5
S10-37	4	−12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	−12V	P151-2

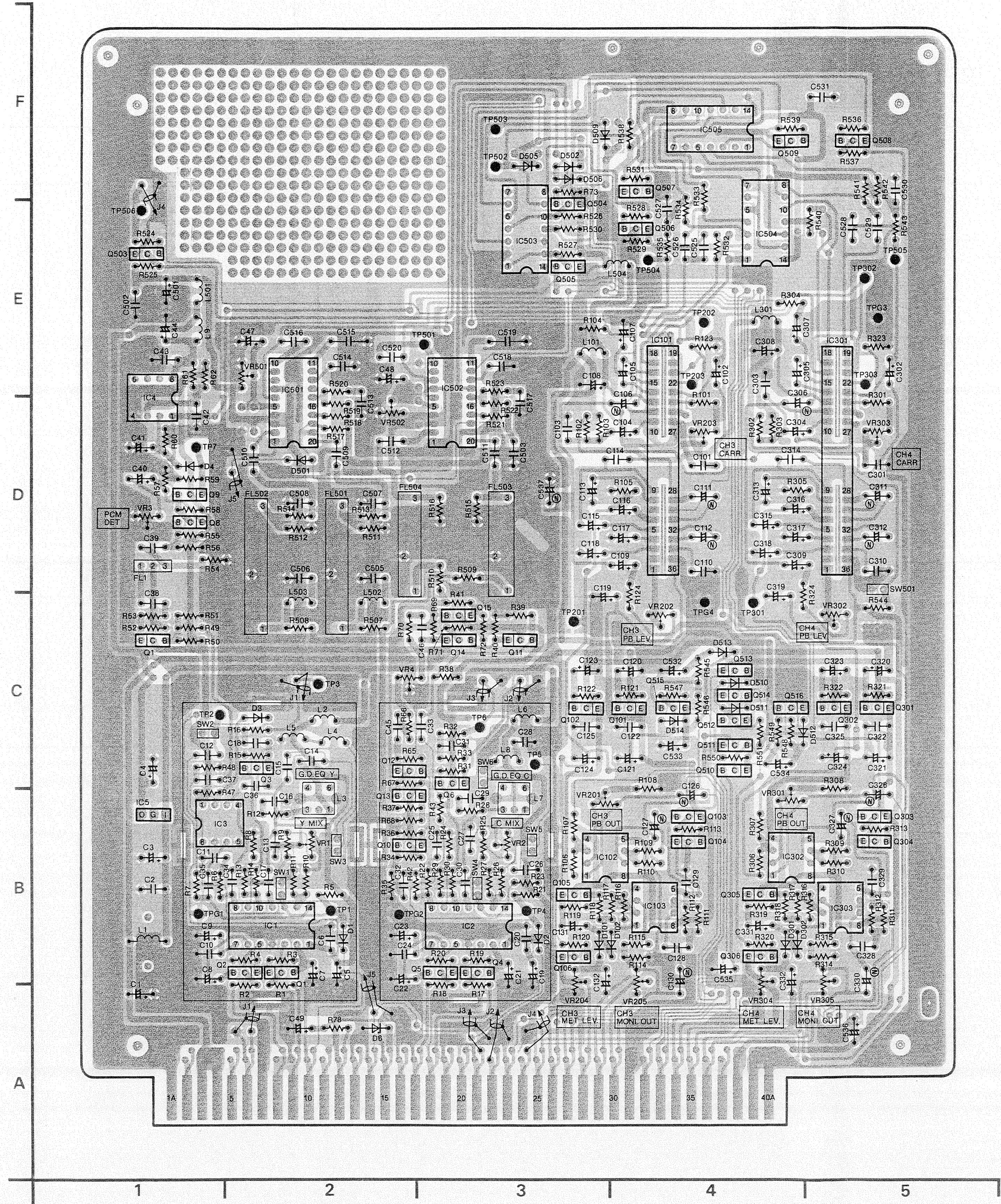
S5 PB AMP & FM AUDIO SCHEMATIC DIAGRAM



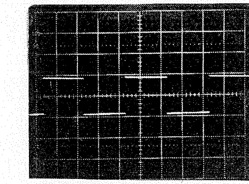
S4 Y PLAYBACK
SCHEMATIC DIAGRAM


FM AUDIO SUB P.C.B.
IC101 VEP80443A
IC301 VEP80443A
IC 1 AN6298NS
IC 2 AN3922NS
IC501 AN3920K
IC502 AN3920K
IC 503 SN74LS74AN
IC 504 MC14066BCP
IC 505 μPC319
Q505 DTC144EA
Q503 2SC2206
Q504 2SC2206
Q506 2SC2206
Q507 2SC2206
Q508 2SC2206
Q509 2SC2206
FL501 ELB4M043
FL502 ELB4M043
FL503 ELB4L053
FL504 ELB4L053
400KHz BPF
700KHz BPF
CH3 PB LEV
CH4 PB LEV
CH3 CURR
CH4 CURR
SW501
25A PCM DET
12B Y RF METER→S4-7A
15B METER OUT→P67-1→P117-5
24B C DO PULSE→S3-9
12A GND
15A GND
22B GND
11
12
13
14
15
16
17
18
19
20
21

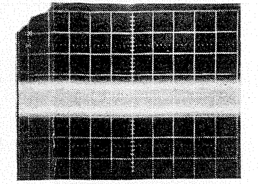
S5 PB AMP & FM AUDIO P.C. BOARD (VEP84071A)



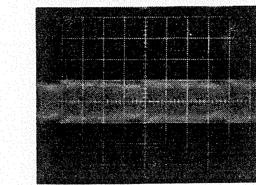
S5 PB AMP & FM AUDIO WAVEFORM



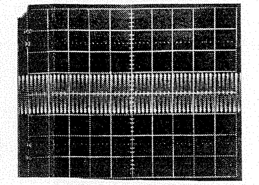
TP1/TP4
1 V/10 msec. div.



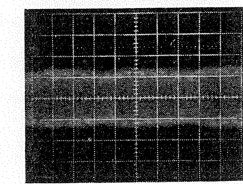
TP201/TP301
500 mV/2 msec. div.



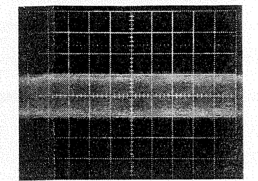
TP3
200 mV/5 msec. div.



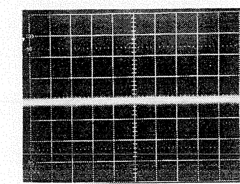
TP203/TP303
100 mV/5 msec. div.



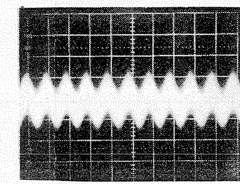
TP6
200 mV/5 msec. div.



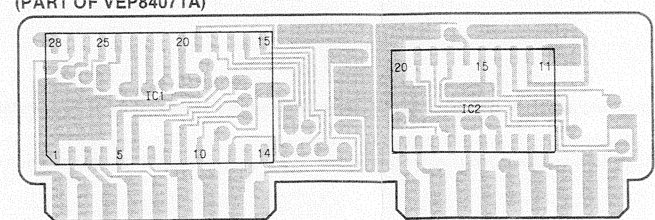
TP501
500 mV/5 msec. div.



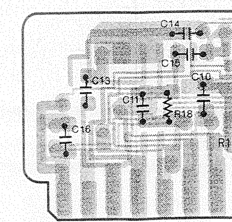
TP7
100 mV/5 msec. div.



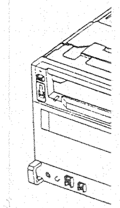
TP505
200 mV/1 msec. div.



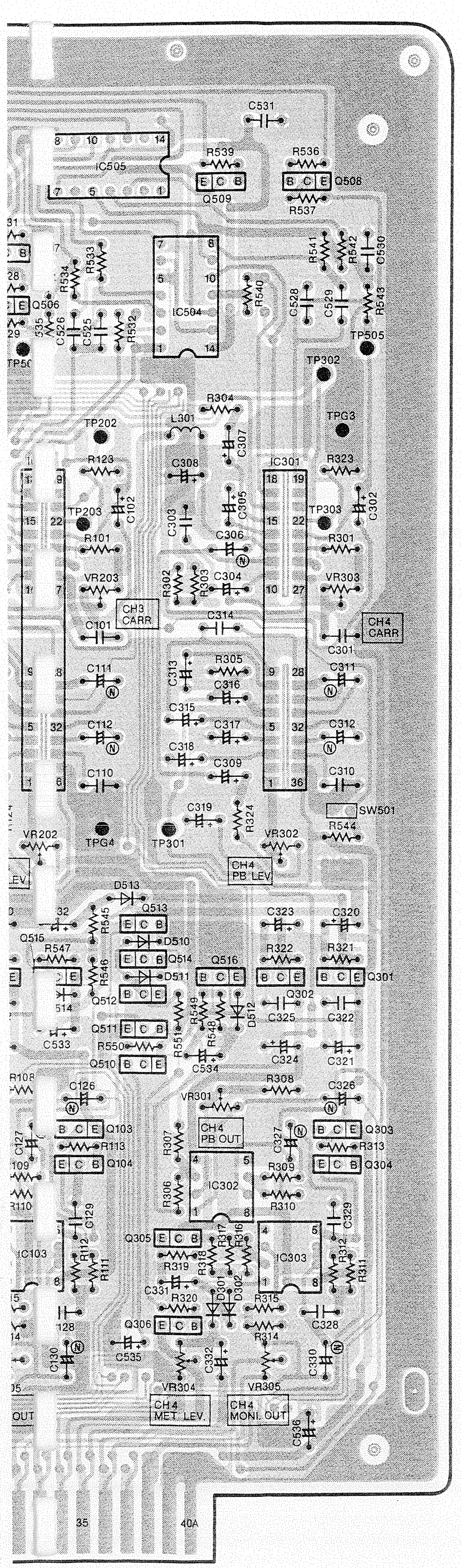
FM AUDIO SUB P.C.B. (VEP80443A)
(PART OF VEP84071A)



(COMPONENT SIDE)

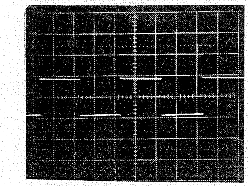


·0 1A)

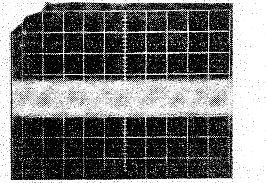


4 5

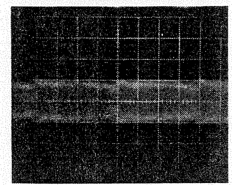
S5 PB AMP & FM AUDIO WAVEFORM



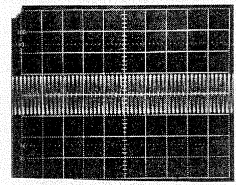
TP1/TP4
1V/10msec. div.



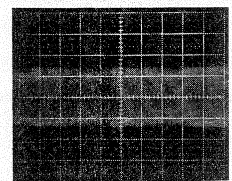
TP201/TP301
500mV/2msec. div.



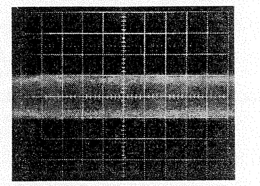
TP3
200mV/5msec. div.



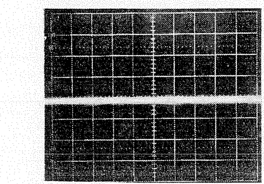
TP203/TP303
100mV/5msec. div.



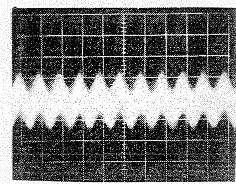
TP6
200mV/5msec. div.



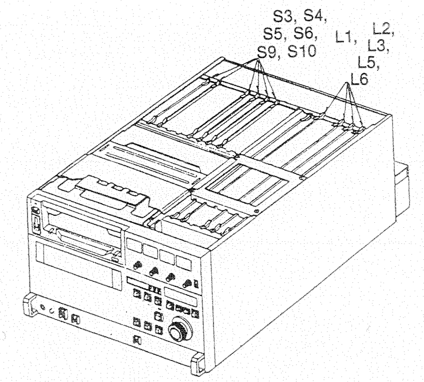
TP501
500mV/5msec. div.



TP7
100mV/5msec. div.



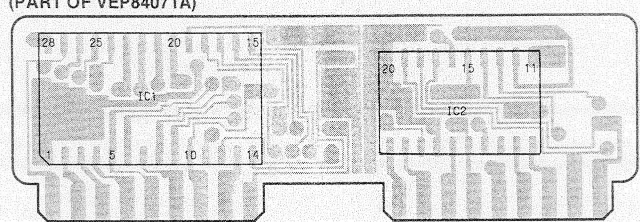
TP505
200mV/1msec. div.



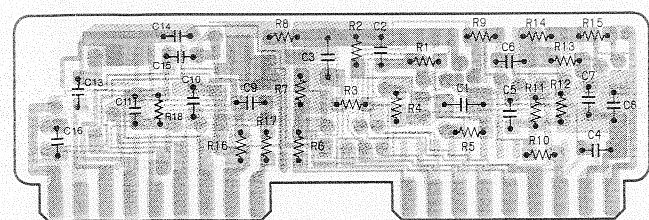
PB AMP & FM AUDIO (S5)	
Transistors	
Q1	A-2
Q2	A-2
Q3	B-2
Q7	C-1
Q8	D-1
Q9	D-1
Q10	B-2
Q11	C-3
Q12	B-2
Q13	B-2
Q101	C-4
Q102	C-3
Q103	B-4
Q104	B-4
Q105	B-3
Q106	A-3
Q300	B-4
Q301	C-5
Q302	C-5
Q303	B-5
Q304	B-5
Q305	B-4
Q503	E-1
Q504	E-3
Q505	E-3
Q506	E-4
Q507	F-4
Q508	F-5
Q509	F-4
Q510	B-4
Q511	C-4
Q512	C-4
Q513	C-4
Q514	C-4
Q515	C-4
Q516	C-4
Integrated Circuits	
IC1	B-2
IC3	B-1
IC4	D-1
IC5	B-1
IC101	D-4
IC102	B-3
IC103	B-4
IC301	D-5
IC302	B-4
IC303	B-5
IC501	D-2
IC502	D-3
IC503	E-3
IC504	E-4
IC505	F-4
Test Points	
TP1	B-2
TP2	C-1
TP3	C-2
TP7	D-1
TP201	C-3
TP202	E-4
TP203	D-4
TP301	C-4
TP302	E-5
TP303	D-5
TP501	E-3
TP502	F-3
TP503	F-3
TP504	E-4
TP505	E-5
TP506	E-1
TPG1	B-1
TPG2	B-2
TPG3	E-5
TPG4	C-4
Adjustments	
VR1	B-2
VR3	D-1
VR4	C-2
VR201	B-3
VR202	C-4
VR203	D-4
VR204	A-3
VR205	A-4
VR301	C-4
VR302	C-5
VR303	D-5
VR304	A-4
VR305	A-5
VR501	E-2
VR502	D-2

ADDRESS INFORMATION

FM AUDIO SUB P.C.B. (VEP80443A)
(PART OF VEP84071A)



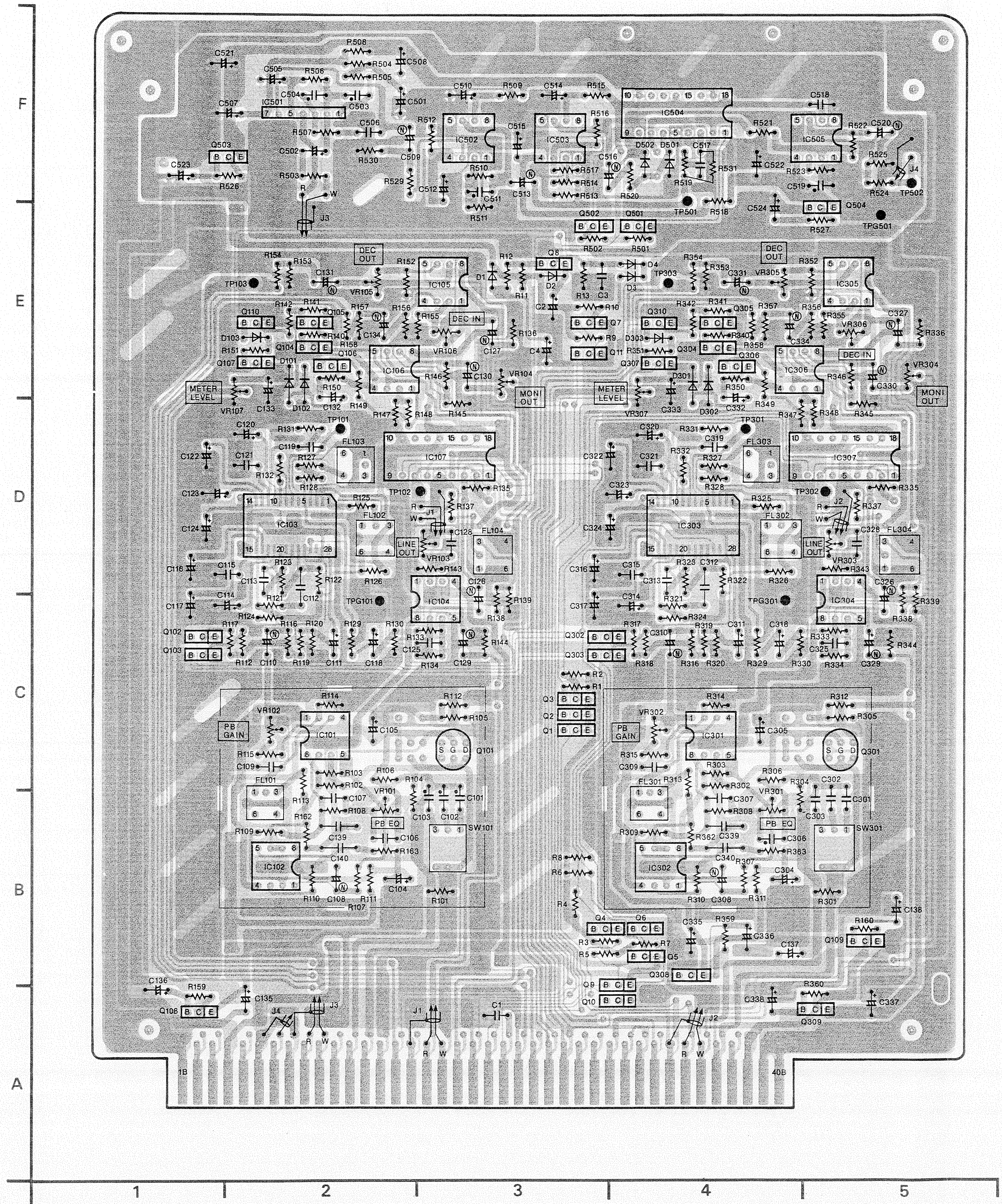
(COMPONENT SIDE)



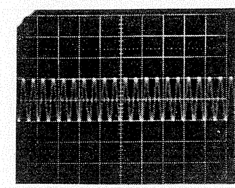
(FOIL SIDE)

REVERSE SIDE
S6 AUDIO P.C.B.

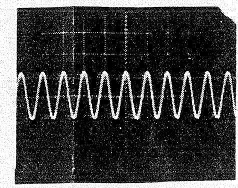
S6 AUDIO P.C. BOARD (VEP84070A)



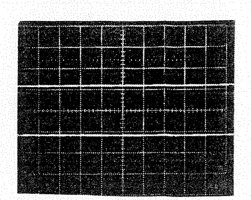
S6 AUDIO WAVEFORM



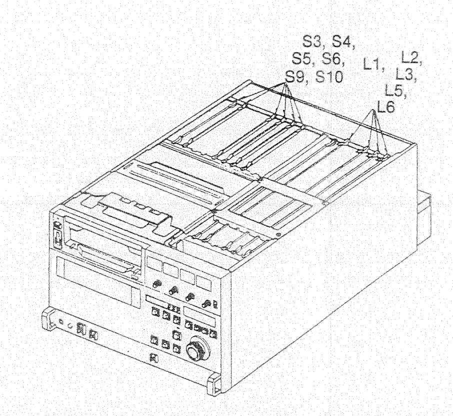
TP102/TP103
TP302/TP303
500mV/2msec. div.

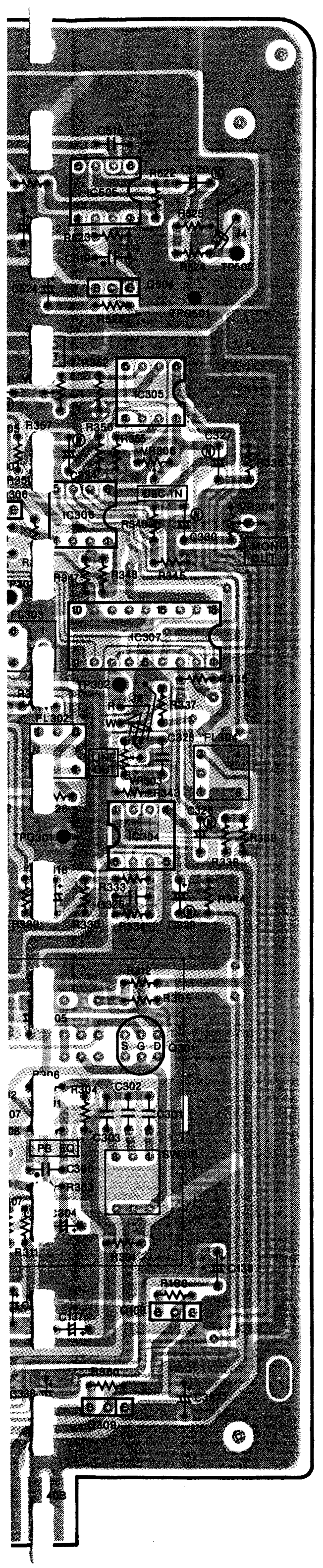


TP104/TP304
1V/1msec. div.



TP503
500mV/2msec. div.





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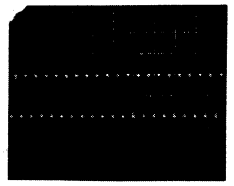
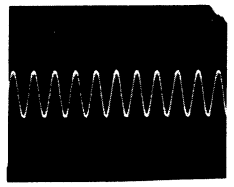
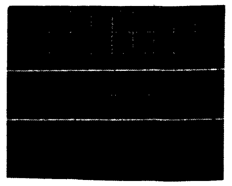
S6 AUDIO WAVEFORM



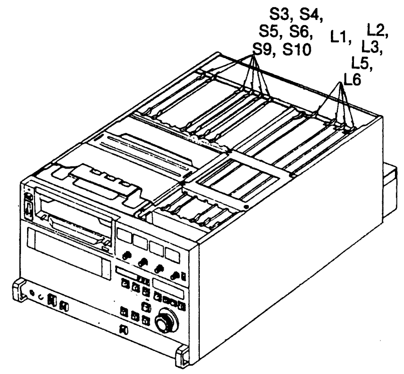
TP102/TP103
TP302/TP303
500mV/2msec. div.



TP104/TP304
1V/1msec. div.



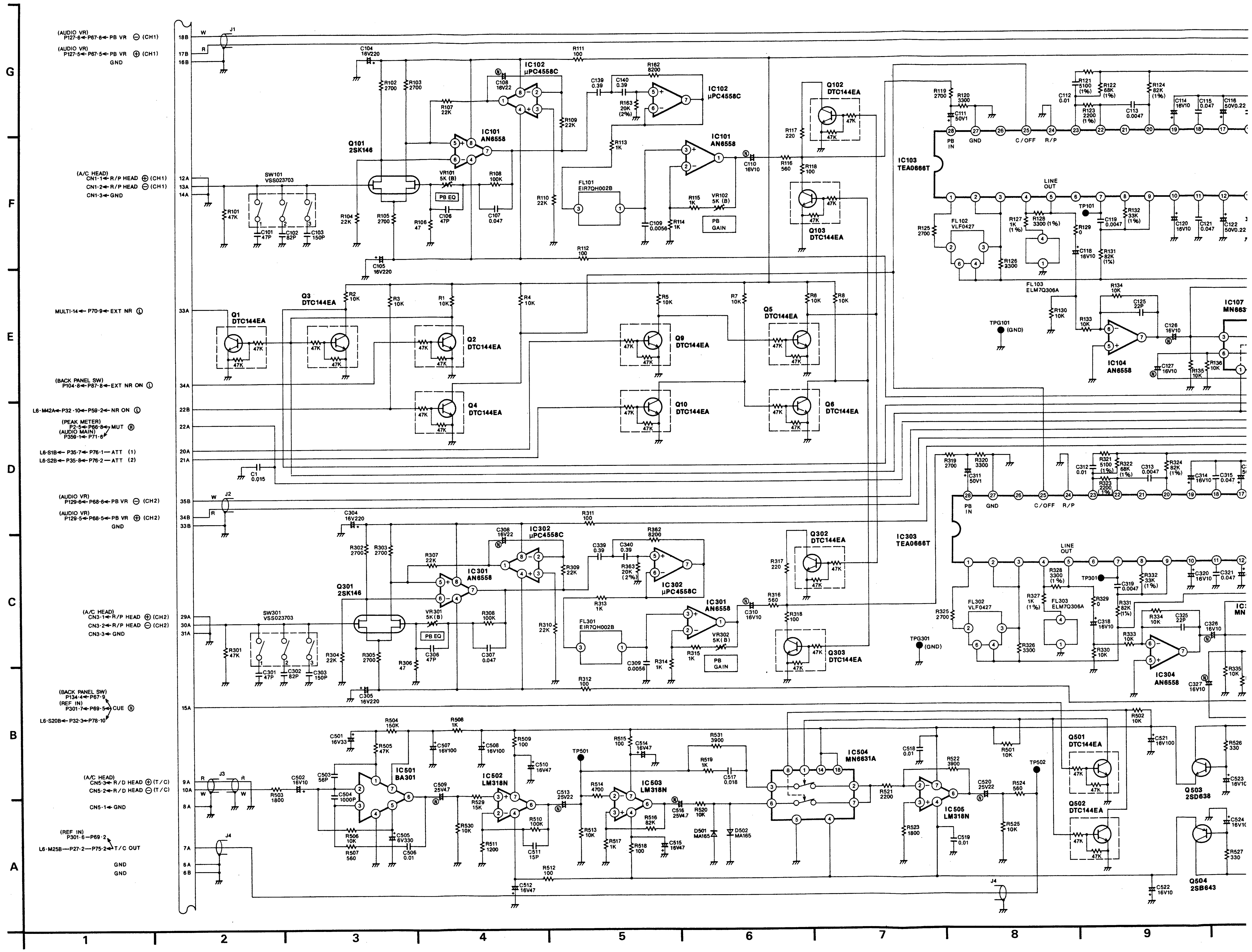
TP503
500mV/2msec. div.

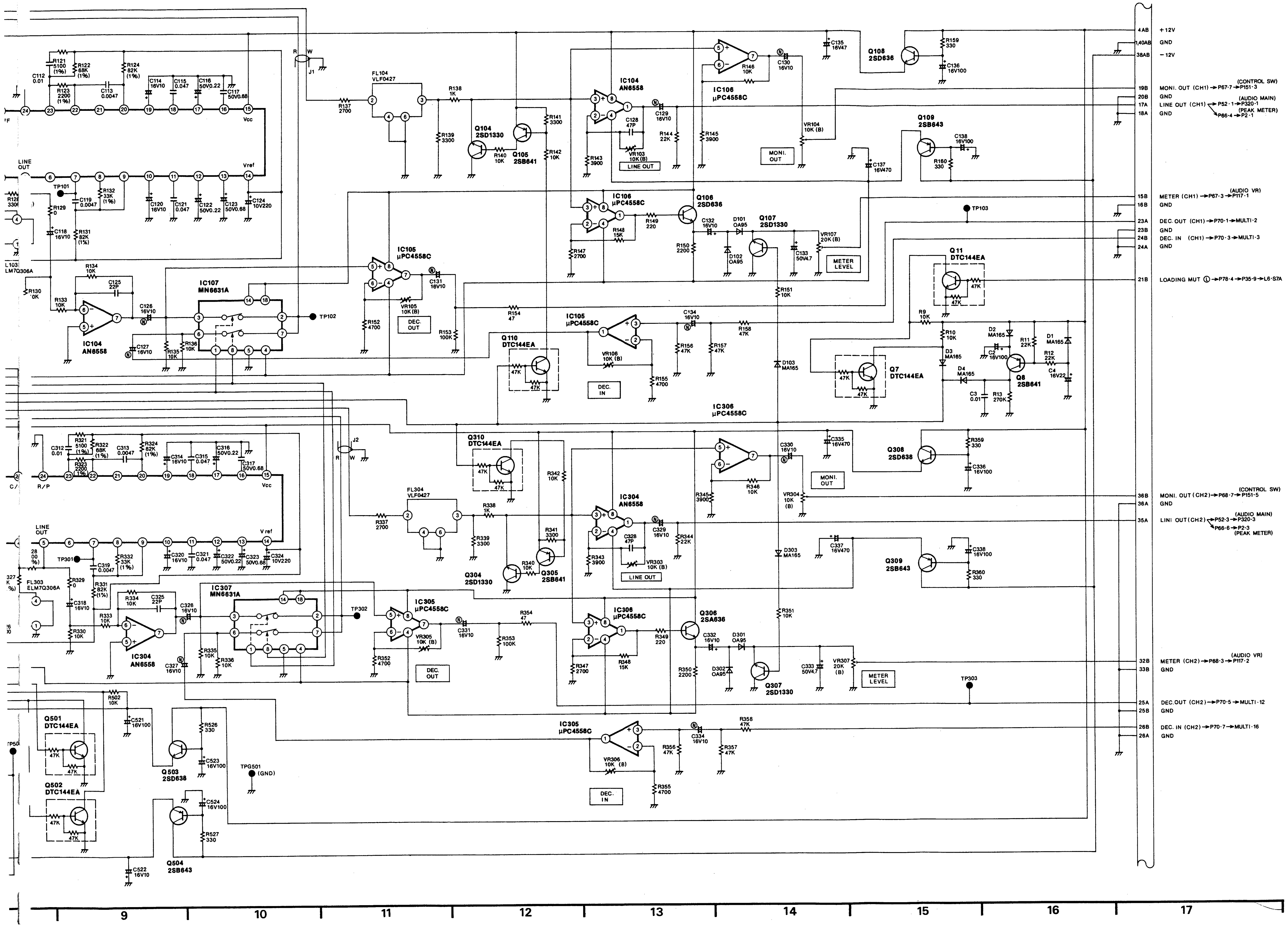


AUDIO (S6)	
Transistors	
Q1	C-3
Q2	C-3
Q3	C-3
Q4	B-3
Q5	B-4
Q6	B-4
Q7	E-3
Q8	E-3
Q9	A-3
Q10	A-3
Q11	E-3
Q101	C-3
Q102	C-1
Q103	C-1
Q104	E-2
Q105	E-2
Q106	E-2
Q107	E-2
Q108	A-1
Q109	B-5
Q110	E-2
Q301	C-5
Q302	C-3
Q305	E-4
Q307	E-4
Q308	A-4
Q309	A-5
Q310	E-4
Q501	E-3
Q502	E-3
Q503	F-1
Q504	E-5
Integrated Circuits	
IC101	C-2
IC102	B-2
IC103	D-2
IC104	C-3
IC105	E-3
IC106	E-2
IC107	D-3
IC301	C-4
IC302	B-4
IC303	D-4
IC304	C-5
IC305	E-5
IC306	E-4
IC307	D-5
IC501	F-2
IC502	F-3
IC503	F-3
IC504	F-4
IC505	F-5
Test Points	
TP101	D-2
TP102	D-2
TP103	E-2
TP301	C-4
TP302	D-5
TP303	E-4
TP501	F-4
TP502	F-5
TPG101	C-2
TPG301	C-4
TPG501	E-5
Adjustments	
VR101	B-2
VR102	C-2
VR103	D-3
VR104	E-3
VR105	E-2
VR106	E-3
VR107	D-2
VR301	B-4
VR302	C-4
VR303	D-5
VR304	E-5
VR305	E-4
VR306	E-5
VR307	E-4

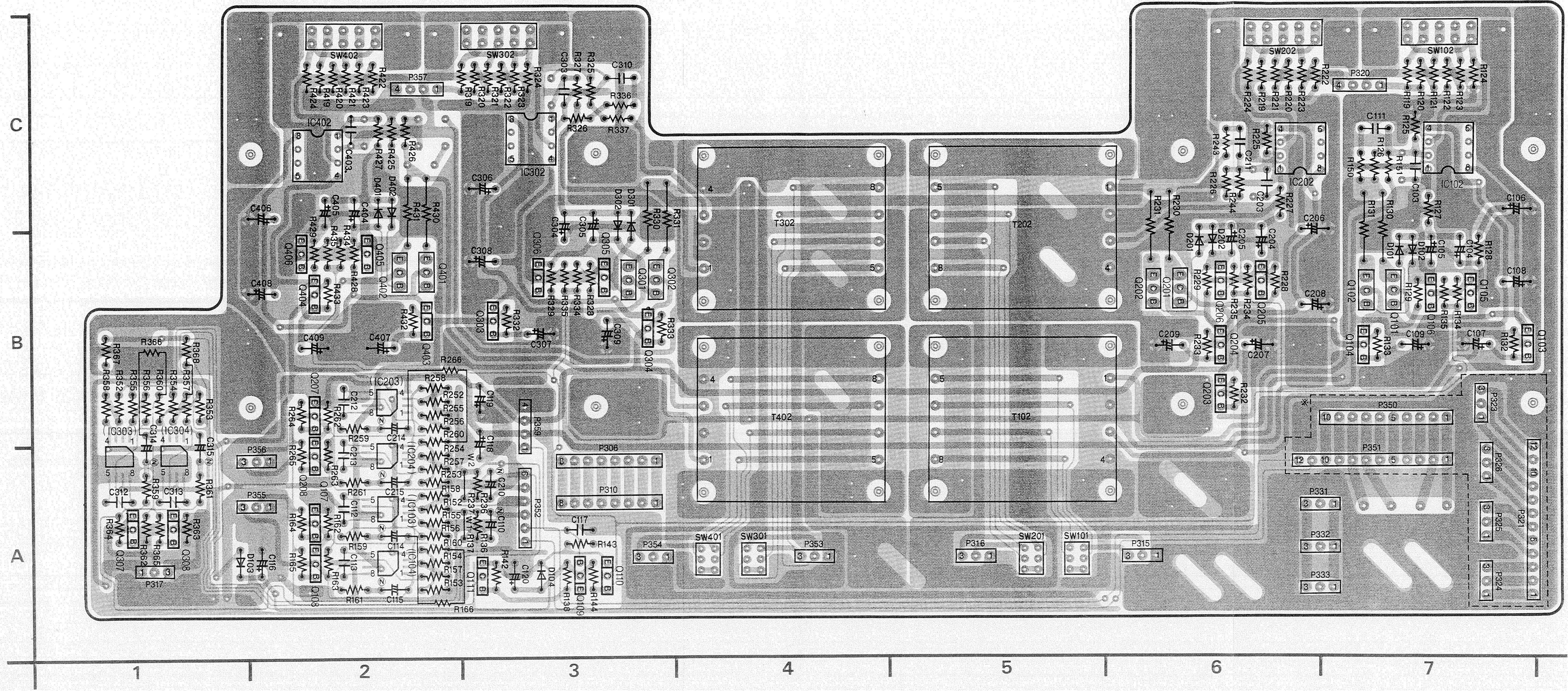
ADDRESS INFORMATION

S6 AUDIO SCHEMATIC DIAGRAM




IC104 AN6558
IC106 μPC4558C
IC105 μPC4558C
IC107 MN6631A
Q104 2SD1330
Q105 2SB641
Q106 2SD636
Q107 2SD1330
Q108 2SD636
Q109 2SB643
Q110 DTC144EA
Q11 DTC144EA
Q7 DTC144EA
Q8 2SB641
IC304 AN6558
IC305 μPC4558C
IC306 μPC4558C
IC307 MN6631A
Q304 2SD1330
Q305 2SB641
Q306 2SA636
Q307 2SD1330
Q308 2SD638
Q309 2SB643
Q310 DTC144EA
Q501 DTC144EA
Q502 DTC144EA
Q503 2SD638
Q504 2SB643
FL104 VLF0427
FL304 VLF0427
LINE OUT
MONI. OUT
DEC. OUT
DEC. IN
METER LEVEL
TP101
TP102
TP103
TP301
TP302
TP303
TPG501 (GND)
4AB +12V
1,40AB GND
38AB −12V
19B MONI. OUT (CH1) → P67-7 → P151-3 (CONTROL SW)
20B GND
17A LINE OUT (CH1) → P52-1 → P320-1 (AUDIO MAIN)
→ P66-4 → P2-1 (PEAK METER)
18A GND
15B METER (CH1) → P67-3 → P117-1 (AUDIO VR)
16B GND
23A DEC. OUT (CH1) → P70-1 → MULTI-2
23B GND
24B DEC. IN (CH1) → P70-3 → MULTI-3
24A GND
21B LOADING MUT Ⓛ → P78-4 → P35-9 → L6-S7A
36B MONI. OUT (CH2) → P68-7 → P151-5 (CONTROL SW)
36A GND
35A LINI OUT (CH2) → P52-3 → P320-3 (AUDIO MAIN)
→ P66-6 → P2-3 (PEAK METER)
32B METER (CH2) → P68-3 → P117-2 (AUDIO VR)
33B GND
25A DEC.OUT (CH2) → P70-5 → MULTI-12
25B GND
26B DEC. IN (CH2) → P70-7 → MULTI-16
26A GND
9
10
11
12
13
14
15
16
17

AUDIO MAIN P.C. BOARD (VEP84052F)



COMPARISON CHART

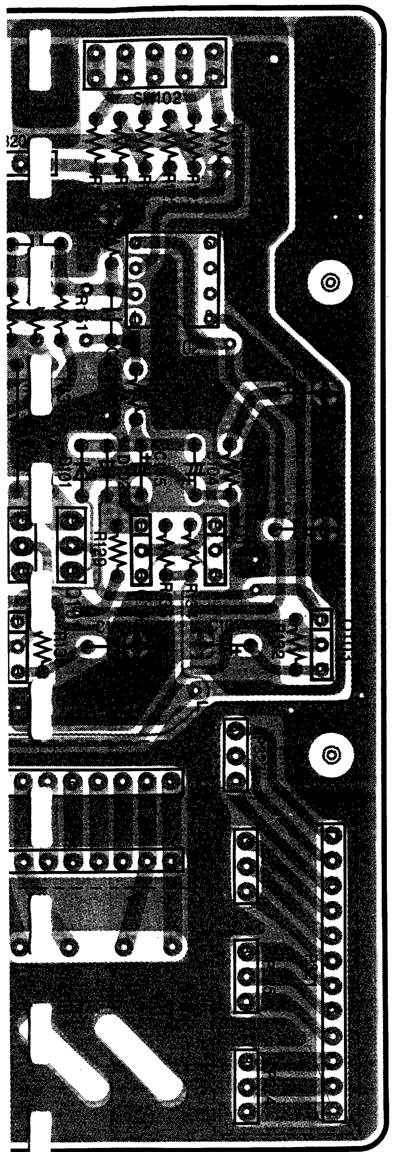
	AUDIO MAIN P.C.B.	
	AU-650B	AU-630
P321	○	—
P323	○	—
P324	○	—
P325	○	—
P326	○	—
P350	○	—
P351	○	—

○: PART IS MOUNTED
–: PART IS NOT MOUNTED

REVERSE SIDE

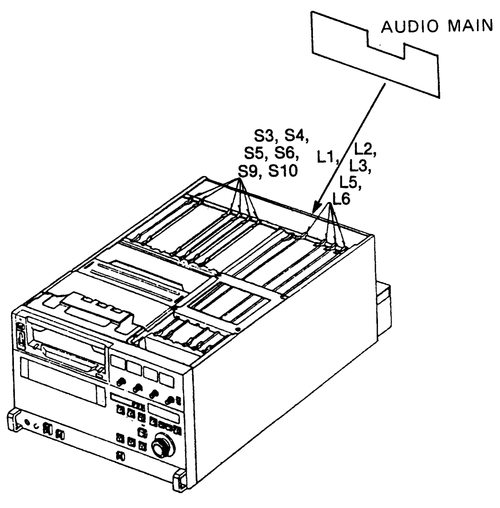
S6 AUDIO
SCHEMATIC DIAGRAM

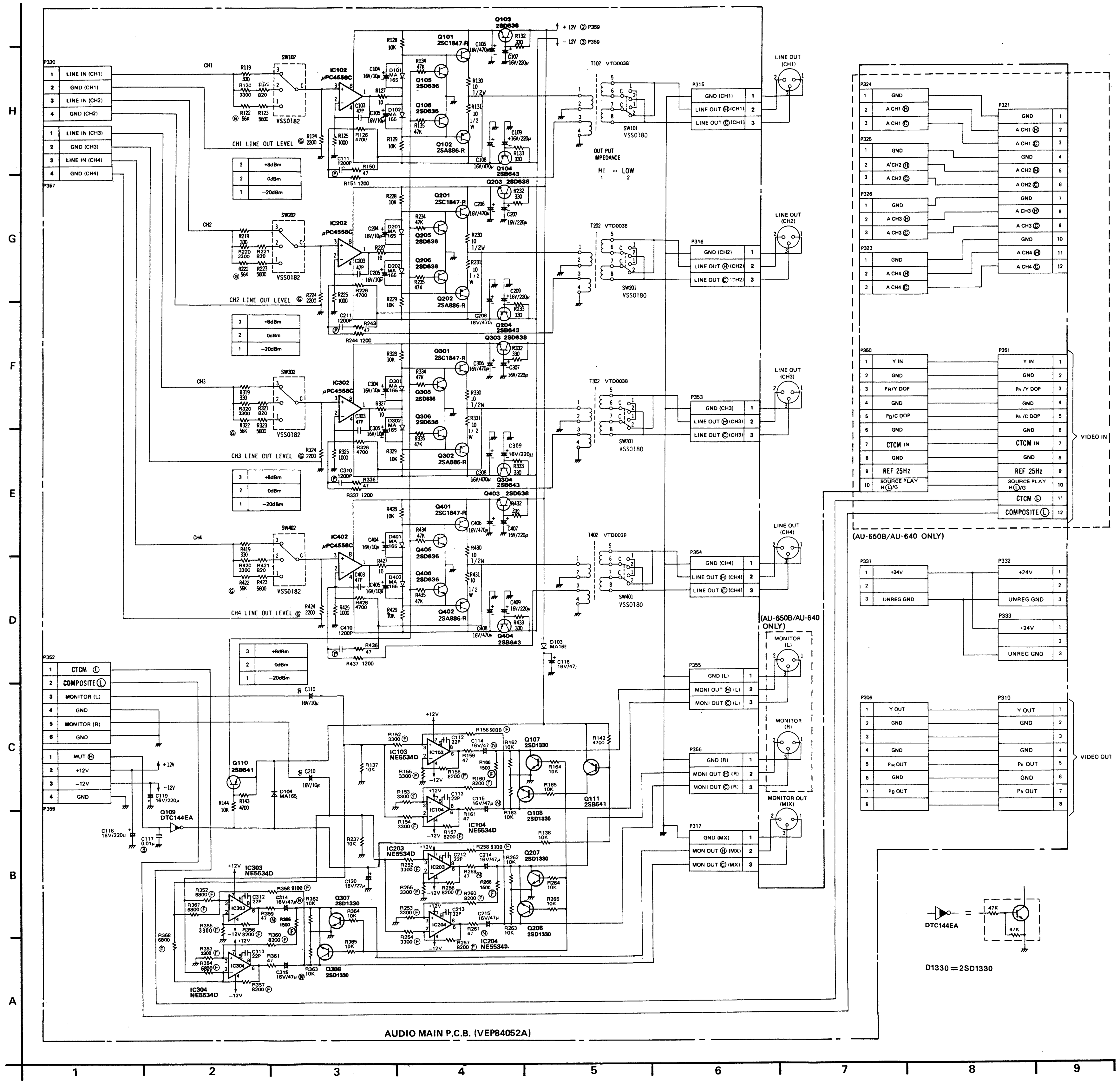
AUDIO MAIN SCHEMATIC DIAGRAM

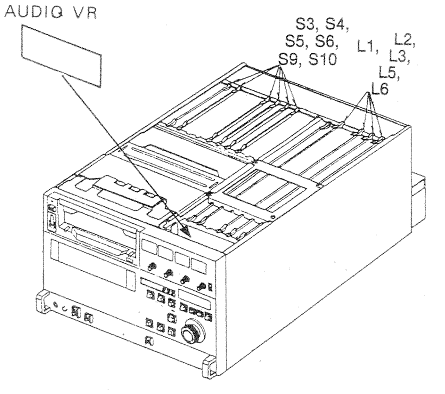


AUDIO MAIN	
Transistors	
Q101	B-7
Q102	B-7
Q103	B-7
Q104	B-7
Q105	B-7
Q106	B-7
Q107	A-2
Q108	A-2
Q109	A-3
Q110	A-3
Q111	A-3
Q201	B-6
Q202	B-6
Q203	B-6
Q204	B-6
Q205	B-6
Q206	B-6
Q207	B-2
Q208	A-2
Q301	B-3
Q302	B-3
Q303	B-3
Q304	B-3
Q305	B-3
Q306	B-3
Q307	A-1
Q308	A-1
Q401	B-2
Q402	B-2
Q403	B-2
Q404	B-2
Q405	B-2
Q406	B-2
Integrated Circuits	
IC102	C-7
IC103	A-2
IC104	A-2
IC202	C-6
IC203	B-2
IC204	A-2
IC302	C-3
IC303	A-1
IC304	A-1

ADDRESS INFORMATION





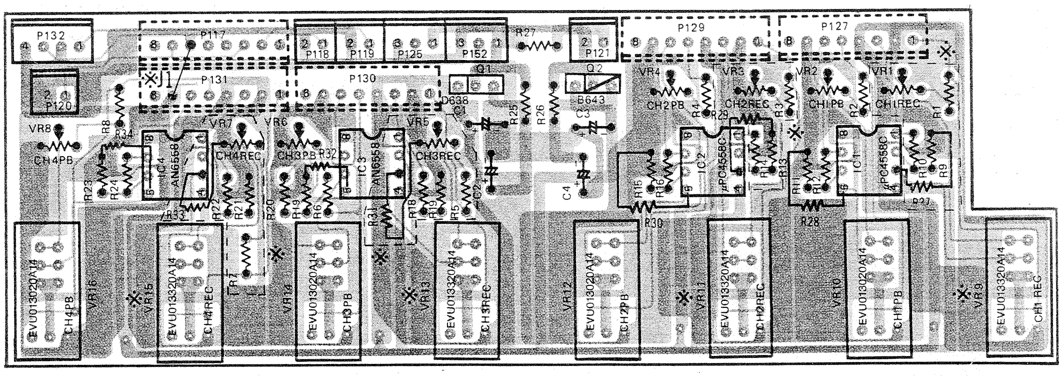


COMPARISON CHART

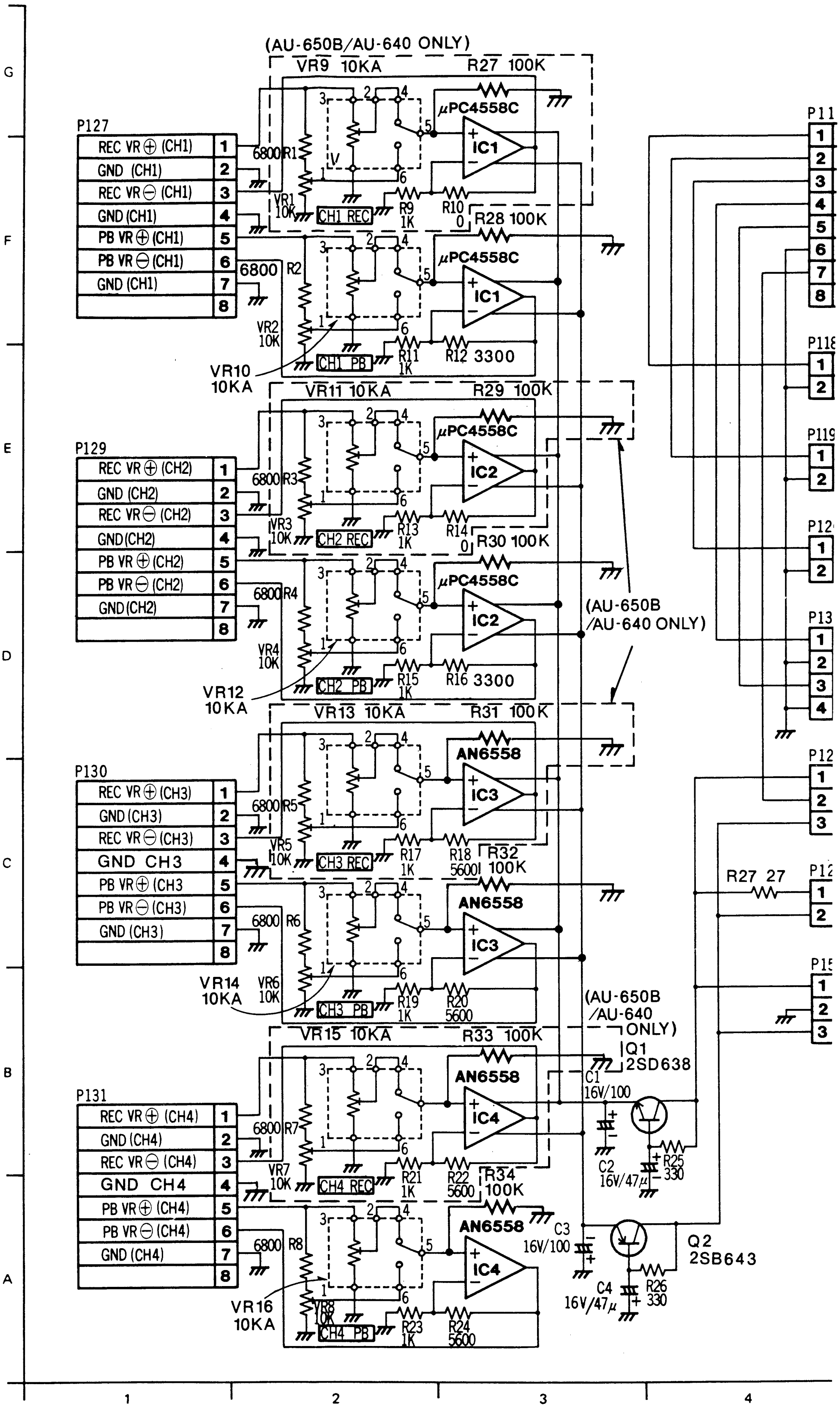
	AUDIO VR P.C.B.	
	AU-650B	AU-630
J1	—	○
R1	6800	—
R3	6800	—
R5	6800	—
R7	6800	—
R9	1K	—
R10	0	—
R13	1K	—
R14	0	—
R17	1K	—
R18	5600	—
R21	1K	—
R22	5600	—
R27	100K	—
R29	100K	—
R31	100K	—
R33	100K	—
VR1	10K	—
VR3	10K	—
VR5	10K	—
VR7	10K	—
VR9	10KA	—
VR11	10KA	—
VR13	10KA	—
VR15	10KA	—

○: PART IS MOUNTED
–: PART IS NOT MOUNTED

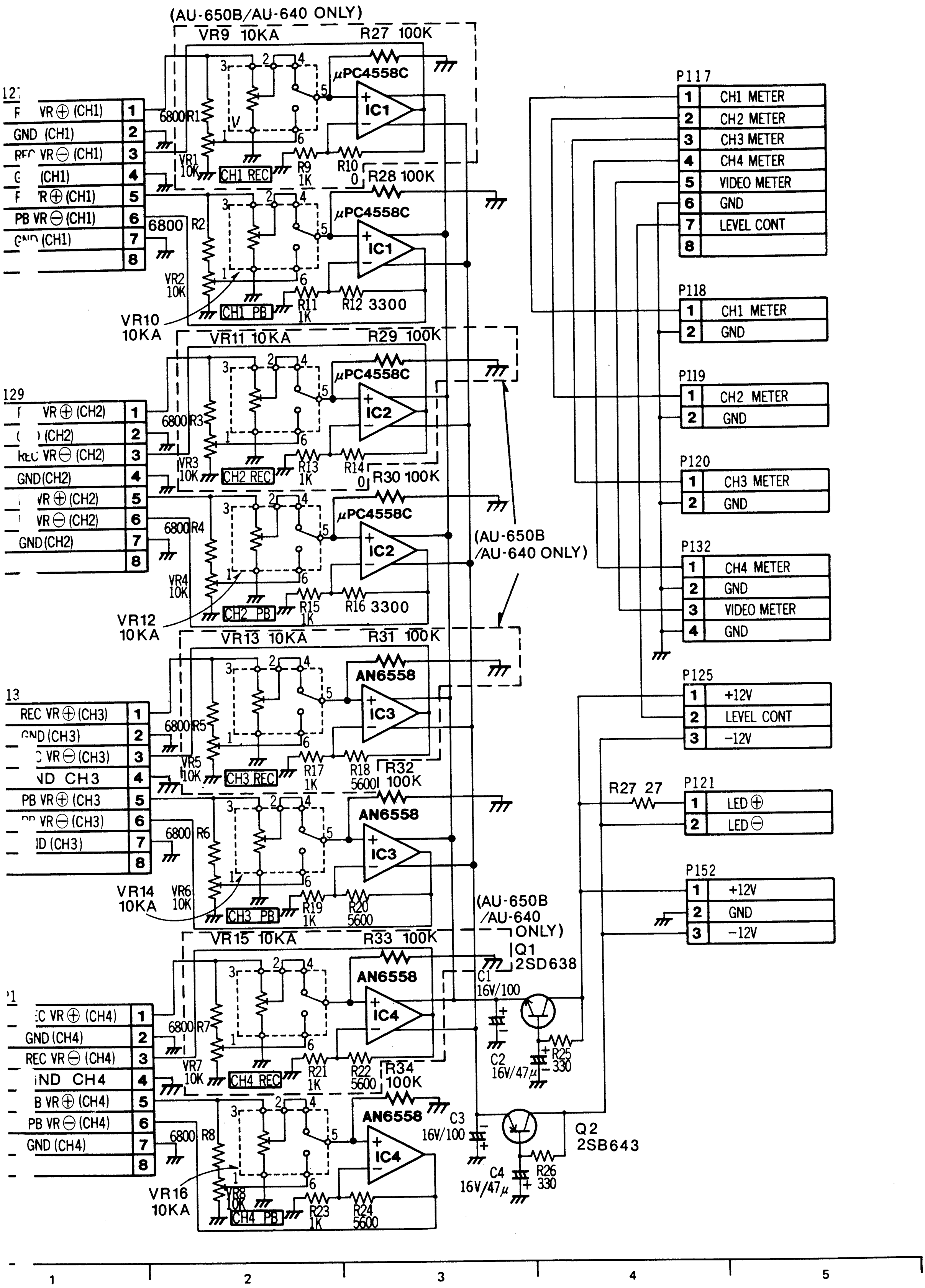
AUDIO VR P.C. BOARD (VEP80081E)



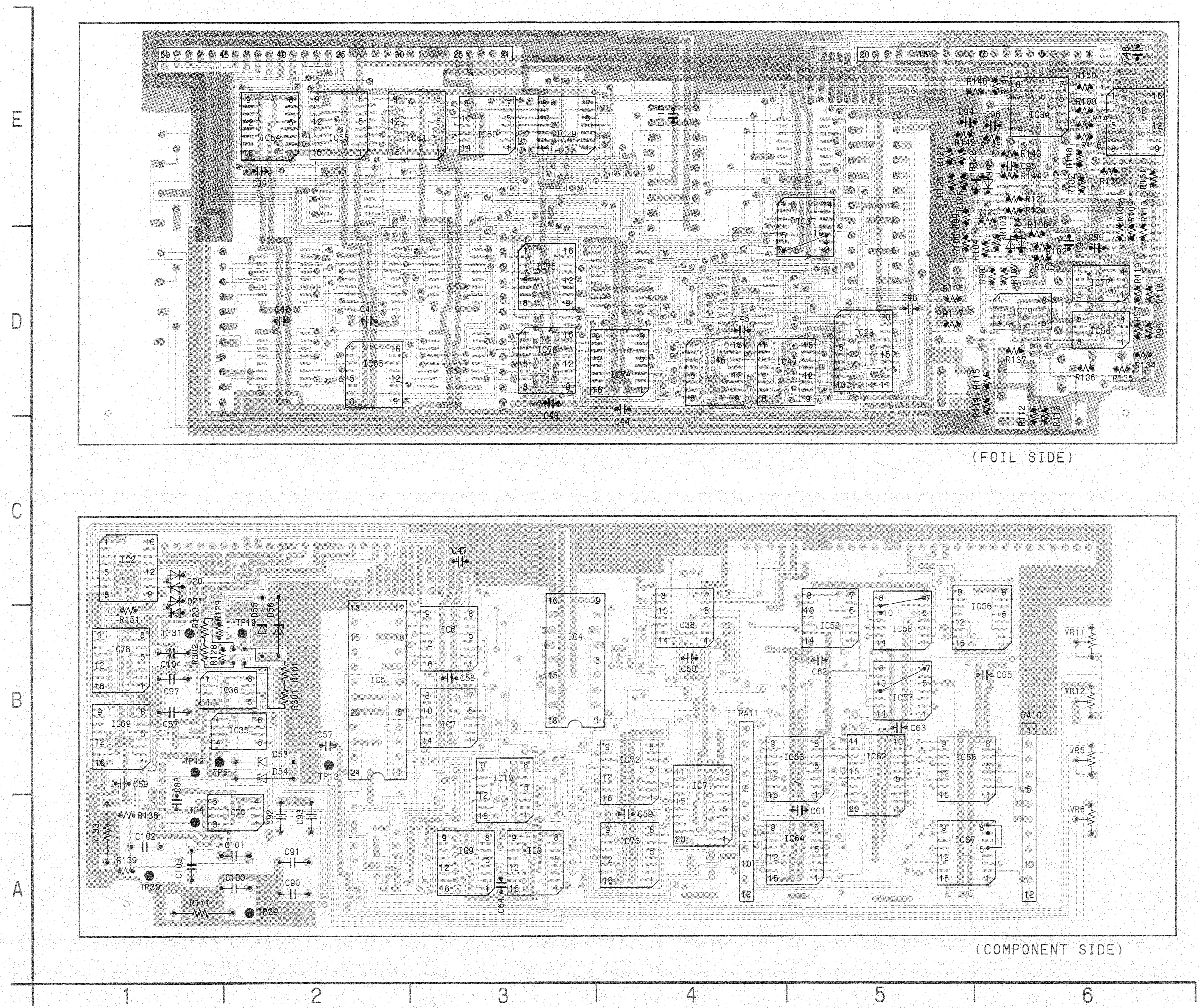
AUDIO VR SCHEMATIC DIAGRAM



VR SCHEMATIC DIAGRAM



S9 AUTO TRACKING SUB P.C. BOARD (VEP82041B) (PART OF VEP82034B)



AT SUB (S9)	
Integrated Circuits	
IC2	C-1
IC4	B-3
IC5	B-2
IC6	B-3
IC7	B-3
IC8	A-3
IC9	A-3
IC10	A-3
IC28	D-5
IC29	E-3
IC32	E-6
IC34	E-6
IC35	B-2
IC36	B-2
IC37	E-5
IC38	B-4
IC46	D-4
IC47	D-5
IC54	E-2
IC55	E-2
IC56	B-6
IC57	B-5
IC58	B-5
IC59	B-5
IC60	E-3
IC61	E-2
IC62	B-5
IC63	B-5
IC64	A-5
IC65	D-2
IC66	B-6
IC67	A-6
IC68	D-6
IC69	B-1
IC70	A-2
IC71	A-4
IC72	B-4
IC73	A-4
IC74	D-4
IC75	D-3
IC76	D-3
IC77	D-6
IC78	B-1
IC79	D-6
Test Points	
TP4	A-1
TP5	B-2
TP12	B-1
TP13	B-2
TP19	B-2
TP29	A-2
TP30	A-1
TP31	B-1
Adjustments	
VR5	B-6
VR6	A-6
VR11	B-6
VR12	B-6

ADDRESS INFORMATION

REVERSE SIDE

S9 AUTO TRACKING
SCHEMATIC DIAGRAM (1/2)

S9 AUTO TRACKING SCHEMATIC DIAGRAM (1/2)

S – 9	AT			
B		NO	A	
S5-1A	–	1	GND	
S6-2A	–	2	+5V	S10–3B
S6-3A	–	3	+12V	S10–5B
S6-4A	–	4	+12V	S10–5B
S6-5A	–	5	+24V	S10–6B
	–	6	UNREG GND	S10–24
	–	7		
P64–1	–	8	MR CTL	
P64–2	–	9	GND	
		10		
		11		
		12		
		13		
		14		
P64–9,11	–	15	GND	
P64–10	Y PB SYNC	16	C PB SYNC	P64–12
		17	PB FRAME 2	P64–8
		18		
		19		
		20		
P77-1	HCONT 1	21	$\overline{\text{STILL POS·F}}$	P74–3
P77-2	HCONT 2	22	$\overline{\text{STILL POS·R}}$	P74–4
P77-3	HCONT 3	23		
P77-4	HCONT 4	24	AT REF H SW	P64–6
P64–5	–	25	GND	P64–7
P64–4	FG2	26	FG1	P64–3
		27		
P77-5	DRUM SERVO (L)	28	AT AK (L)	P74–5
P74–6	AT ON (L)	29	PINCH ON (L)	P74–9
P74–7	NORM PLAY (L)	30	AT EJECT (L)	P74–8
		31		
	GND	32	C RF	S4-7A
S5-22B	–	33	C AT RF IN	S5-22A
S5-22B	–	34	GND	
S3 –9	C DO PLS	35	Y DO PLS	S4 –9A
		36		
S6-37A	–	37	–5V	S10–36B
S6-38A	–	38	- 12V	S10–37B,38B
S5-39A	–	39	GND	S10–39B
S5-40A	–	40	GND	S10–40B

To L0

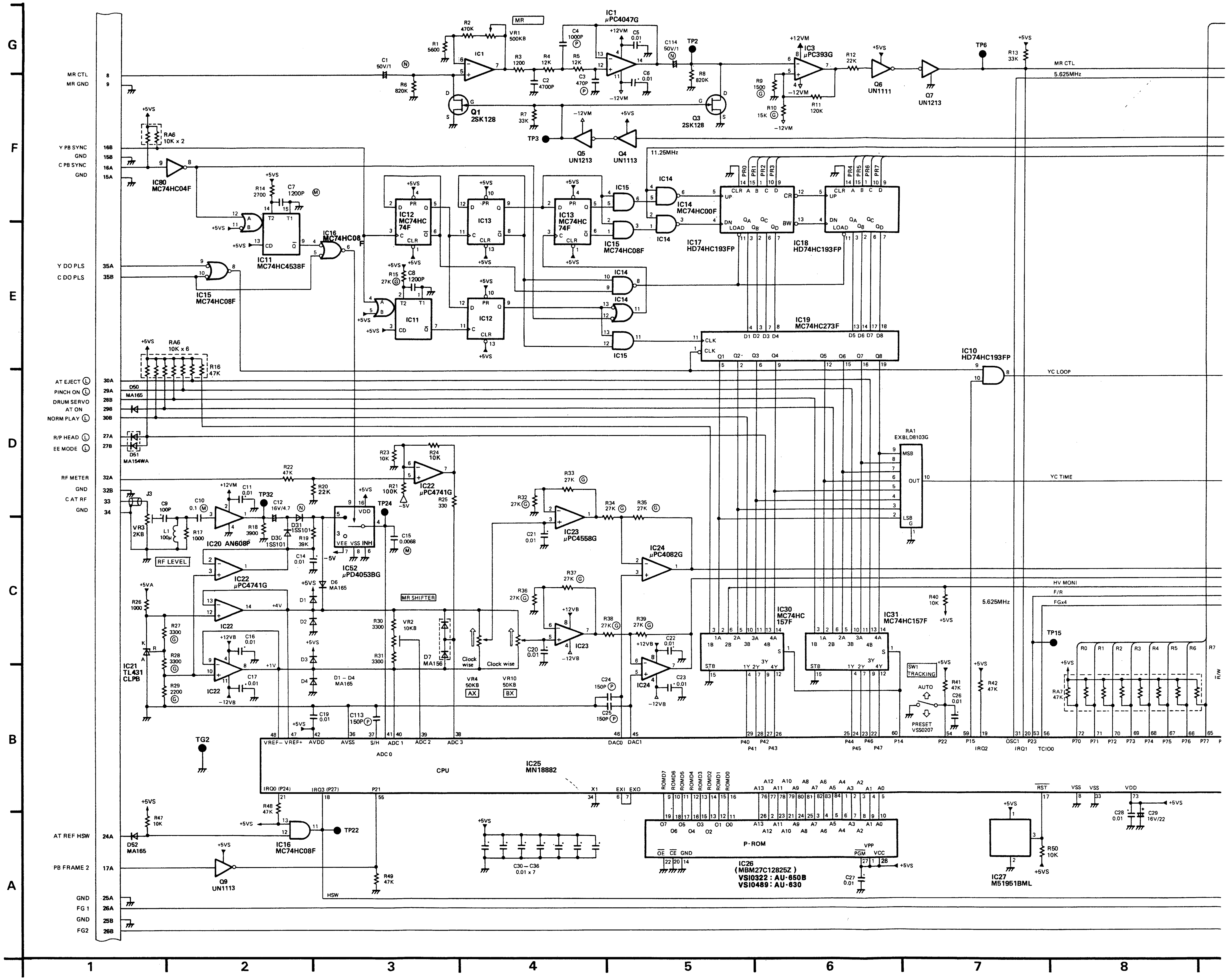
P64			
S9-8	1	MR CTL	P28-1
S9-9	2	GND	P28-2
S9-26A	3	FG1	P22-1
S9-26B	4	FG2	P22-2
S9-25B	5	GND	P22-3
S9-24A	6	REF H SW	P14-5
S9-25A	7	GND	P14-6
S9-17A	8	PB FRAME 2	P26-7
S9-15	9	GND	P26-10
S9-16B	10	Y PB SYNC	P26-9
S9-15	11	GND	P26-12
S9-16A	12	C PB SYNC	P26-11

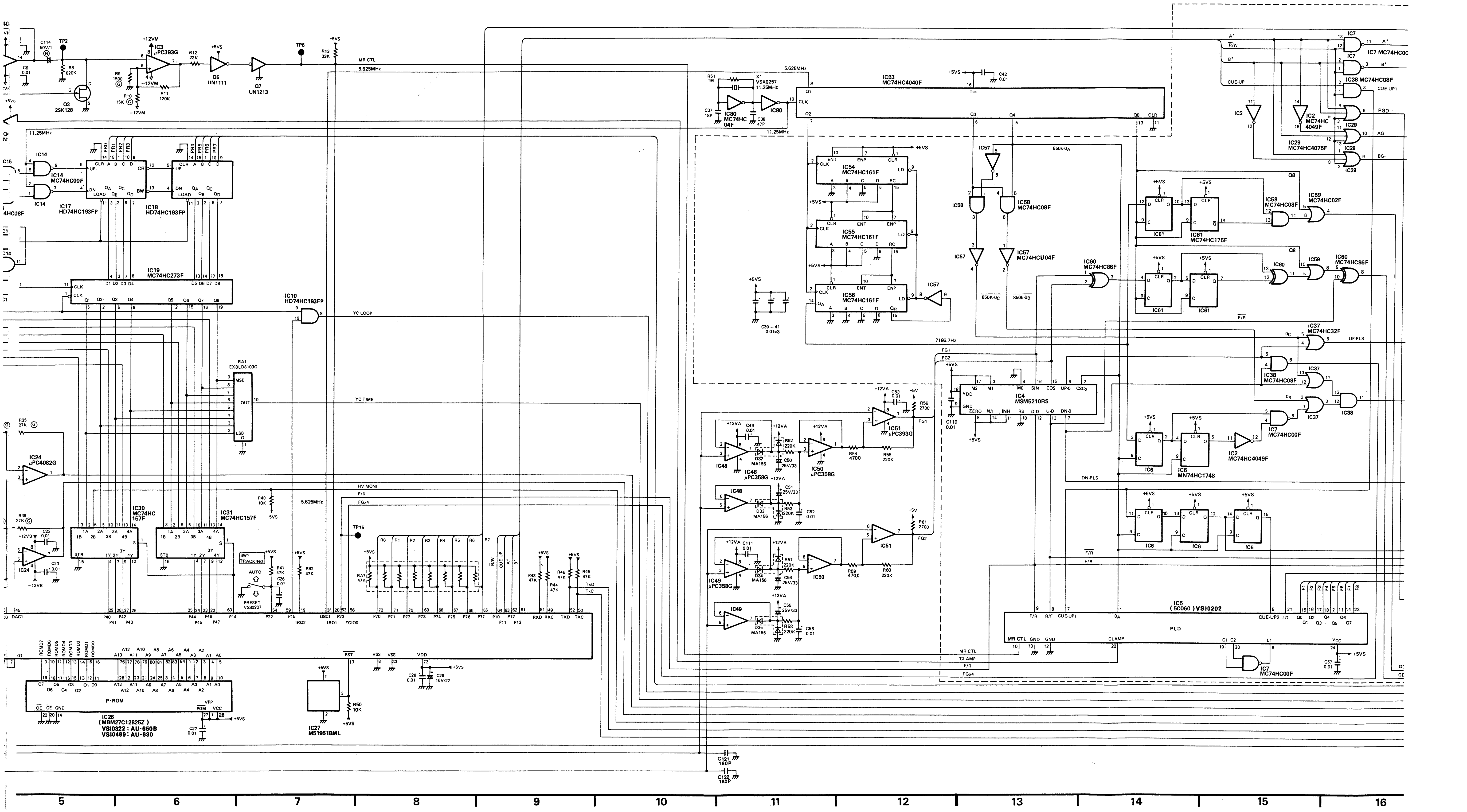
To L0

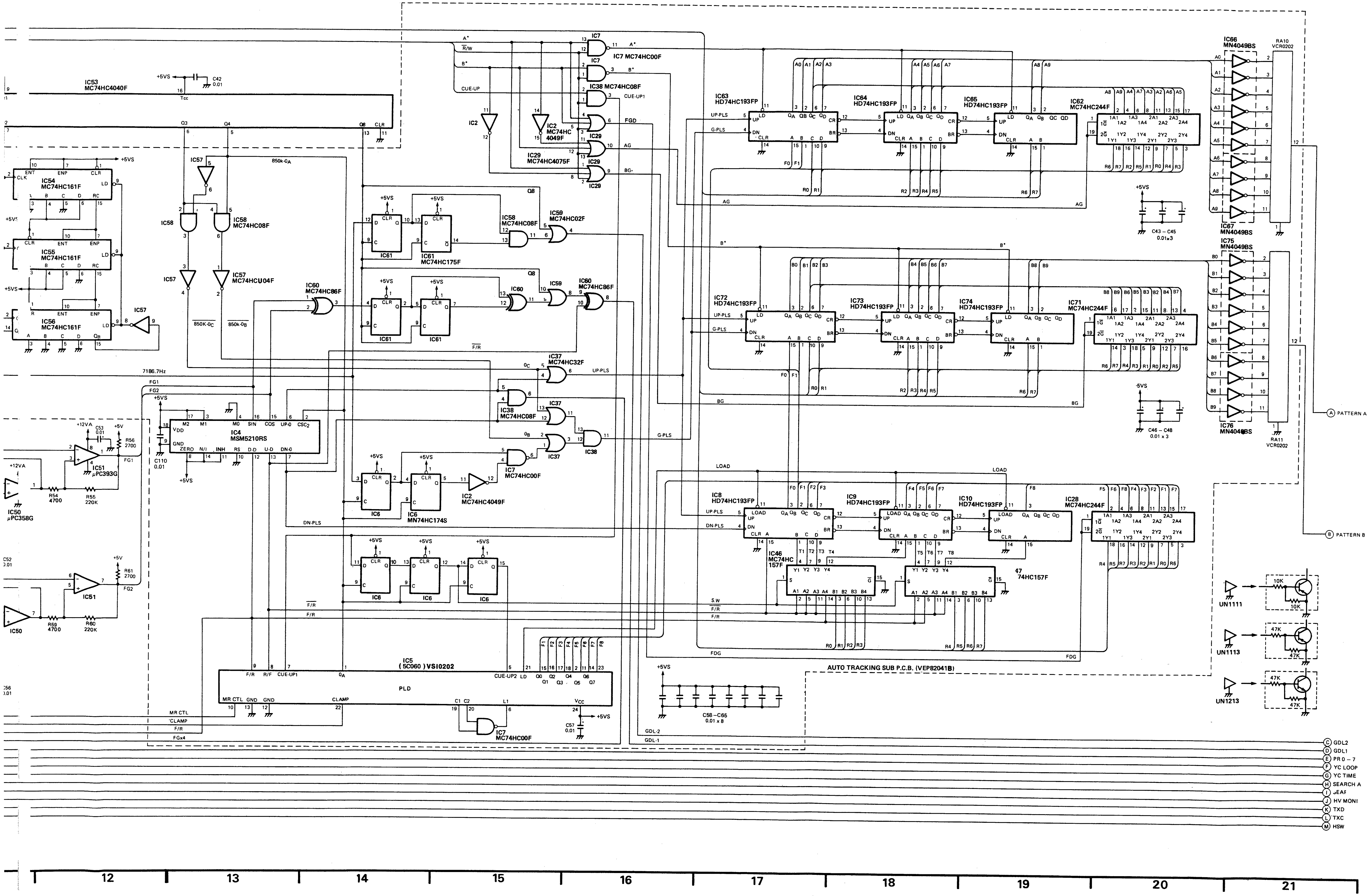
P74			
	1		
	2		
S9-21A	3	$\overline{\text{STILL POS F}}$	P31-3
S9-22A	4	$\overline{\text{STILL POS R}}$	P31-4
S9-28A	5	$\overline{\text{AT AK}}$	P31-5
S9-29B	6	$\overline{\text{AT ON}}$	P31-6
S9-30B	7	$\overline{\text{NORMAL PLAY}}$	P31-7
S9-30A	8	$\overline{\text{AT EJECT}}$	P31-8
S9-29A	9	$\overline{\text{PINCH ON}}$	P31-9
	10		

To L0

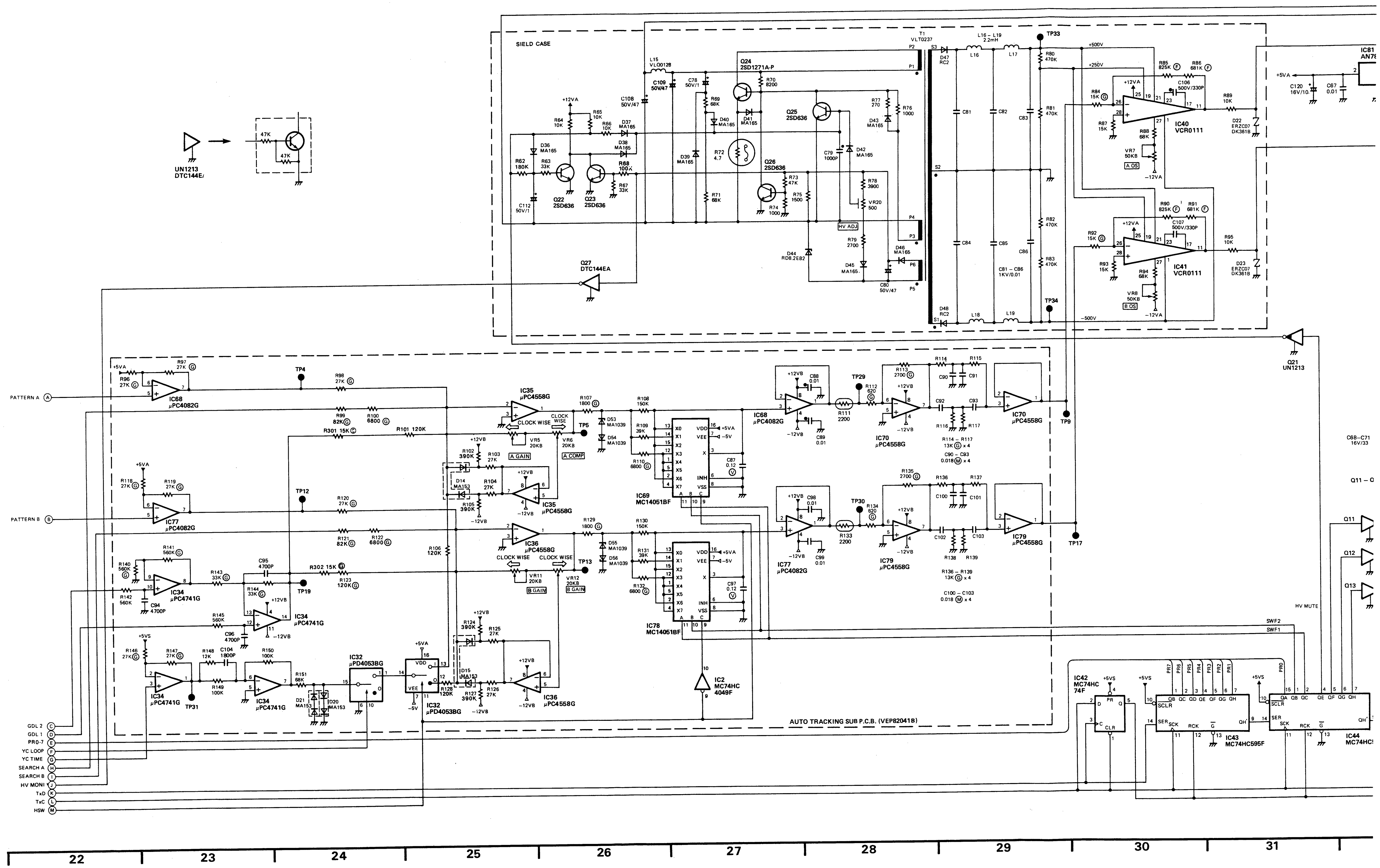
P77			
S9-21B	1	H CONT 1	P34-1
S9-22B	2	H CONT 2	P34-2
S9-23B	3	H CONT 3	P34-3
S9-24B	4	H CONT 4	P34-4
S9-28B	5	$\overline{\text{DRUM SERVO}}$	P35-1

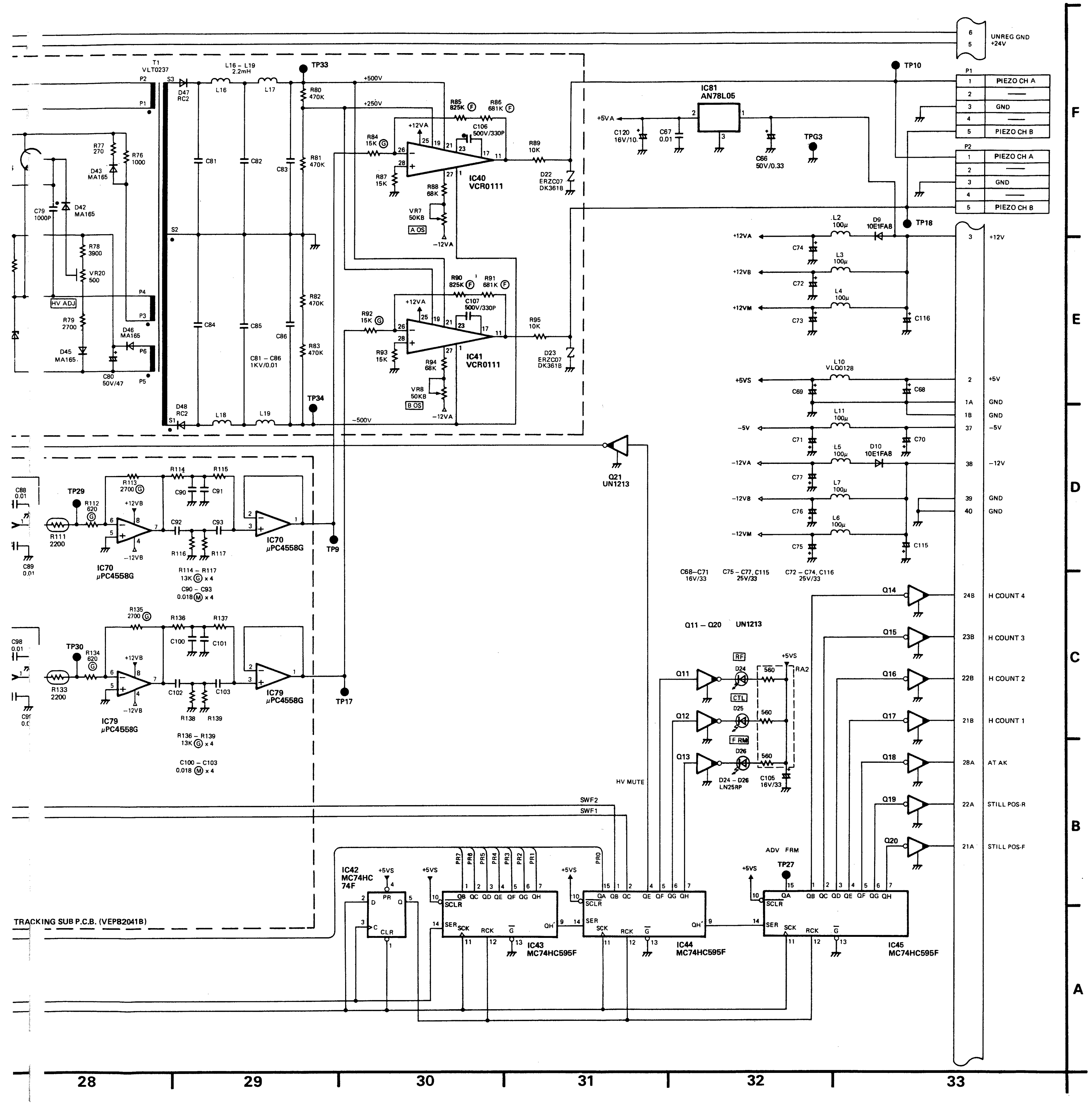



IC3 μPC393G
Q3 2SK128
Q6 UN1111
Q7 UN1213
TP2
TP6
MR CTL
5.625MHz
11.25MHz
X1 VSX0257 11.25MHz
IC80 MC74HC04F
IC53 MC74HC4040F
IC14 MC74HC00F
IC17 HD74HC193FP
IC18 HD74HC193FP
IC19 MC74HC273F
IC10 HD74HC193FP
YC LOOP
RA1 EXBLD8103G
YC TIME
IC24 μPC4082G
IC30 MC74HC157F
IC31 MC74HC157F
SW1 TRACKING
AUTO
PRESET VSS0207
HV MONI
F/R
FGx4
TP15
IC54 MC74HC161F
IC55 MC74HC161F
IC56 MC74HC161F
C39 - 41 0.01×3
IC57
IC58 MC74HC08F
IC57 MC74HCU04F
850k-0A
850K-0C
850k-0B
7186.7Hz
IC60 MC74HC86F
IC61 MC74HC175F
IC59 MC74HC02F
IC37 MC74HC32F
IC38 MC74HC08F
UP-PLS
DN-PLS
IC6 MN74HC174S
IC2 MC74HC4049F
IC7 MC74HC00F
IC7 MC74HC08F
IC38 MC74HC08F
IC29 MC74HC4075F
CUE-UP
CUE-UP1
FGD
AG
BG+
IC4 MSM5210RS
IC48 μPC358G
IC49 μPC358G
IC50 μPC358G
IC51 μPC393G
FG1
FG2
IC5 (5C060) VSI0202
PLD
CLAMP
IC26 (MBM27C128Z5Z)
VSI0322 : AU-650B
VSI0489 : AU-630
P-ROM
IC27 M51951BML
C121 180P
C122 180P
5
6
7
8
9
10
11
12
13
14
15
16

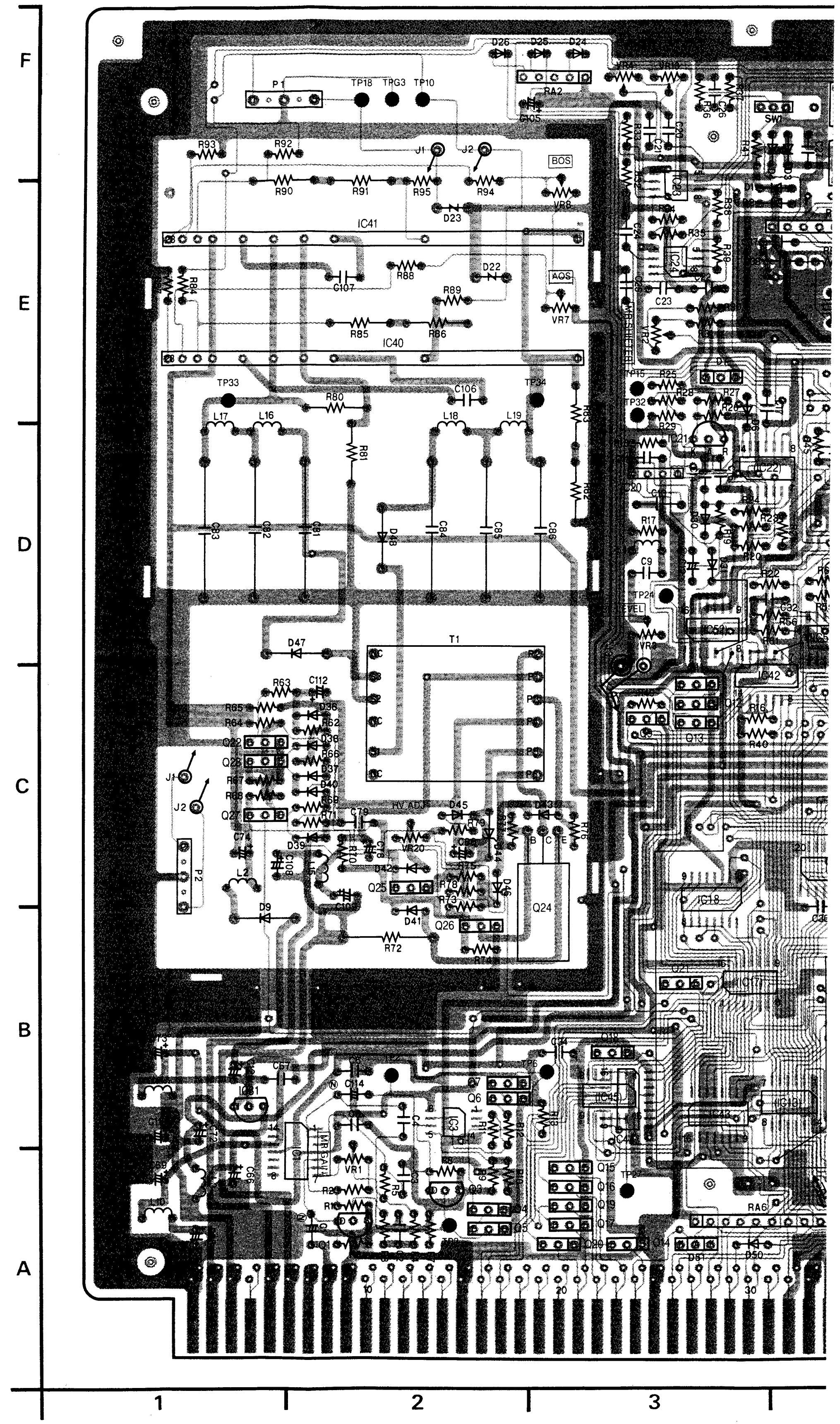

IC53 MC74HC4040F
IC54 MC74HC161F
IC55 MC74HC161F
IC56 MC74HC161F
IC57
IC58 MC74HC08F
IC57 MC74HCU04F
IC60 MC74HC86F
IC4 MSM5210RS
IC51 μPC393G
IC50 μPC358G
IC7 MC74HC00F
IC38 MC74HC08F
IC2 MC74HC 4049F
IC29 MC74HC4075F
IC61 MC74HC175F
IC59 MC74HC02F
IC37 MC74HC32F
IC6 MN74HC174S
IC5 (5C060) VS10202
PLD
IC63 HD74HC193FP
IC64 HD74HC193FP
IC65 HD74HC193FP
IC62 MC74HC244F
IC72 HD74HC193FP
IC73 HD74HC193FP
IC74 HD74HC193FP
IC71 MC74HC244F
IC8 HD74HC193FP
IC9 HD74HC193FP
IC10 HD74HC193FP
IC28 MC74HC244F
IC46 MC74HC 157F
47 74HC157F
IC66 MN4049BS
IC67 MN4049BS
IC75 MN4049BS
IC76 MN4049BS
RA10 VCR0202
RA11 VCR0202
C43 – C45 0.01 x 3
C46 – C48 0.01 x 3
C58 – C65 0.01 x 8
AUTO TRACKING SUB P.C.B. (VEP82041B)
UN1111
UN1113
UN1213
PATTERN A
PATTERN B
GDL2
GDL1
PR 0 – 7
YC LOOP
YC TIME
SEARCH A
LEAF
HV MONI
TXD
TXC
HSW
12
13
14
15
16
17
18
19
20
21

S9 AUTO TRACKING SCHEMATIC DIAGRAM (2/2)

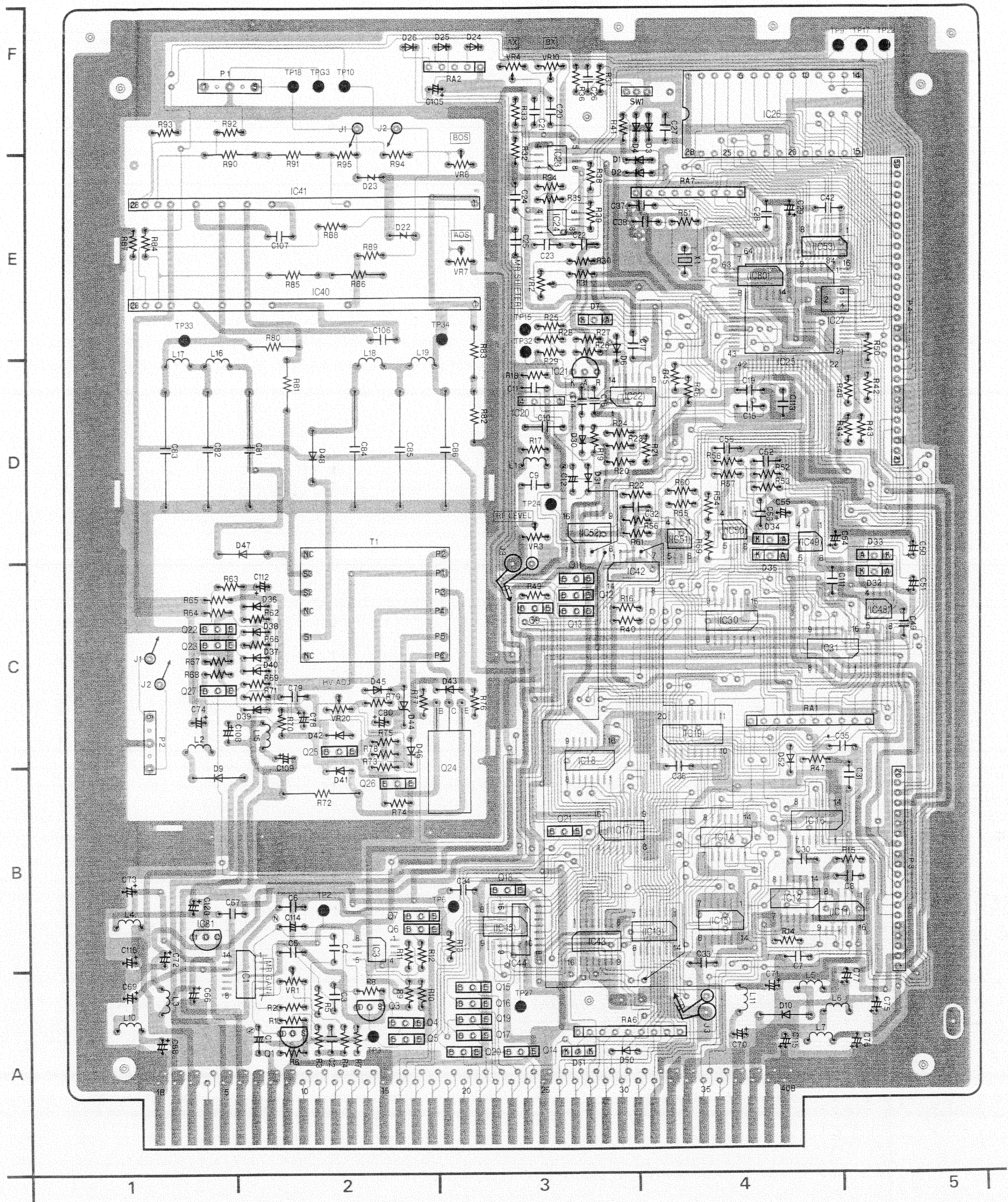


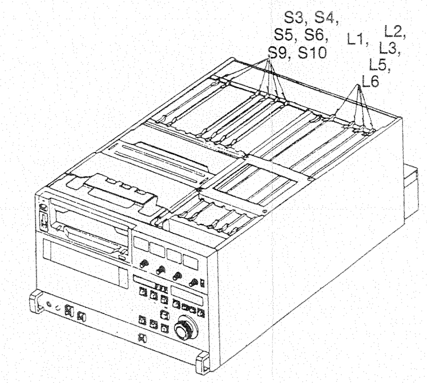


S9 AUTO TRACKING P.C. BOARD (VEP82034B)

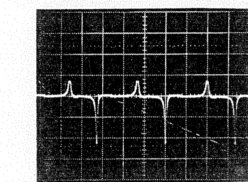


S9 AUTO TRACKING P.C. BOARD (VEP82034B)

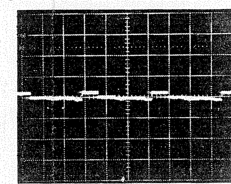




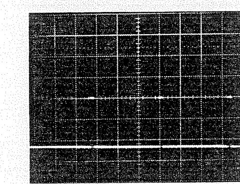
S9 AUTO TRACKING WAVEFORMS



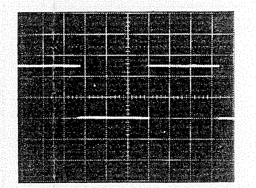
TP2 PLAY
1V/10msec. div.



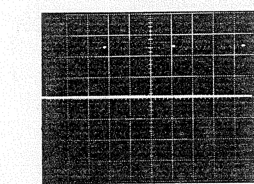
TP13 PLAY
1V/10msec. div.



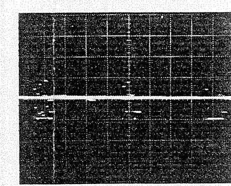
TP3 PLAY
5V/5msec. div.



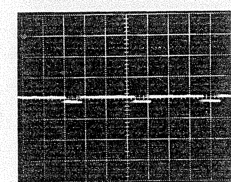
TP22 PLAY
2V/5msec. div.



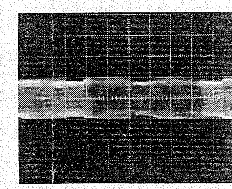
TP6 PLAY
2V/10msec. div.



TP31 PLAY
5V/1msec. div.



TP12 PLAY
1V/10msec. div.



TP32 PLAY
2V/5msec. div.

AT (S9)	
Transistors	
Q1	A-2
Q3	A-2
Q4	A-2
Q5	A-2
Q6	B-2
Q7	B-2
Q9	C-3
Q11	C-3
Q12	C-3
Q13	C-3
Q14	A-3
Q15	A-3
Q16	A-3
Q17	A-3
Q18	B-3
Q19	A-3
Q20	A-3
Q21	B-3
Q22	C-1
Q23	C-1
Q25	C-2
Q27	C-1
Integrated Circuits	
IC1	A-2
IC3	A-2
IC11	B-2
IC12	B-4
IC13	B-4
IC14	B-4
IC15	B-4
IC16	B-4
IC17	B-3
IC18	B-3
IC19	C-4
IC20	D-3
IC21	D-3
IC22	D-3
IC23	E-3
IC24	E-3
IC26	F-4
IC30	C-4
IC31	C-4
IC42	C-3
IC43	B-3
IC44	B-3
IC45	B-3
IC48	C-5
IC49	D-4
IC50	D-4
IC51	D-4
IC52	D-3
IC53	E-4
IC80	E-4
IC81	B-1
Test Point	
TP2	B-2
TP3	A-2
TP6	B-3
TP9	F-4
TP10	F-2
TP15	E-3
TP17	F-5
TP18	F-2
TP22	F-5
TP24	D-3
TP27	A-3
TP32	E-3
TP33	E-1
TP34	E-3
TPG3	F-2
Adjustments	
VR3	D-3
VR4	F-3
VR7	E-3
VR8	E-3
VR10	F-3
VR20	C-2

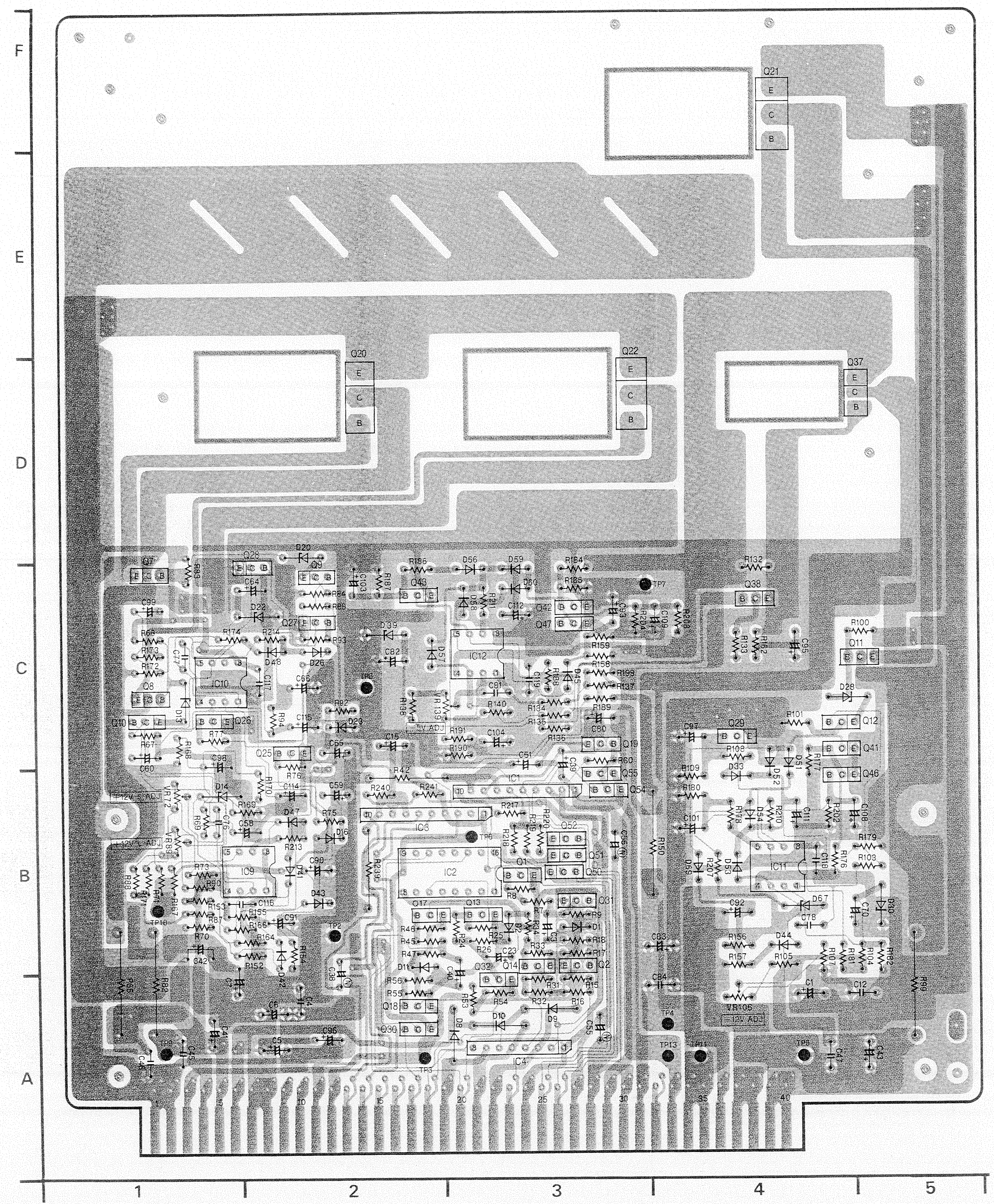
ADDRESS INFORMATION

REVERSE SIDE
S10 POWER & DRIVE

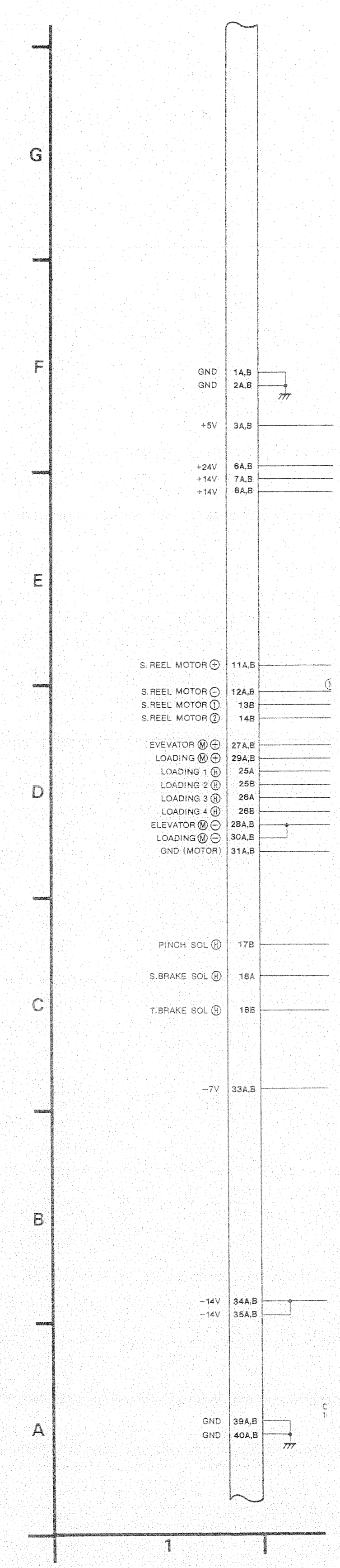
S10 POWER & DRIVE P.C. BOARD (VEP81027B)

POWER DRIVE (S10)	
Transistors	
Q1	B-3
Q2	A-3
Q7	C-1
Q8	C-1
Q9	C-2
Q10	C-1
Q11	C-5
Q12	B-4
Q13	B-3
Q14	A-3
Q17	A-2
Q18	A-2
Q19	C-3
Q20	D-2
Q21	E-4
Q22	D-3
Q25	C-2
Q26	C-1
Q27	C-2
Q28	C-2
Q29	C-4
Q30	A-2
Q31	B-3
Q32	A-3
Q37	D-5
Q38	C-4
Q41	B-4
Q42	C-3
Q43	C-2
Q46	B-4
Q47	C-3
Q50	B-3
Q51	B-3
Q52	B-3
Q54	B-3
Q55	C-3
Integrated Circuits	
IC1	B-3
IC2	B-3
IC3	B-2
IC4	A-3
IC9	B-2
IC10	C-1
IC11	B-4
IC12	C-3
Test Points	
TP2	B-2
TP4	A-4
TP5	A-4
TP6	B-3
TP7	C-4
TP8	C-2
TP9	A-1
TP10	B-1
TP11	A-4
Adjustments	
VR72	B-1
VR89	B-1
VR106	A-4
VR139	C-3

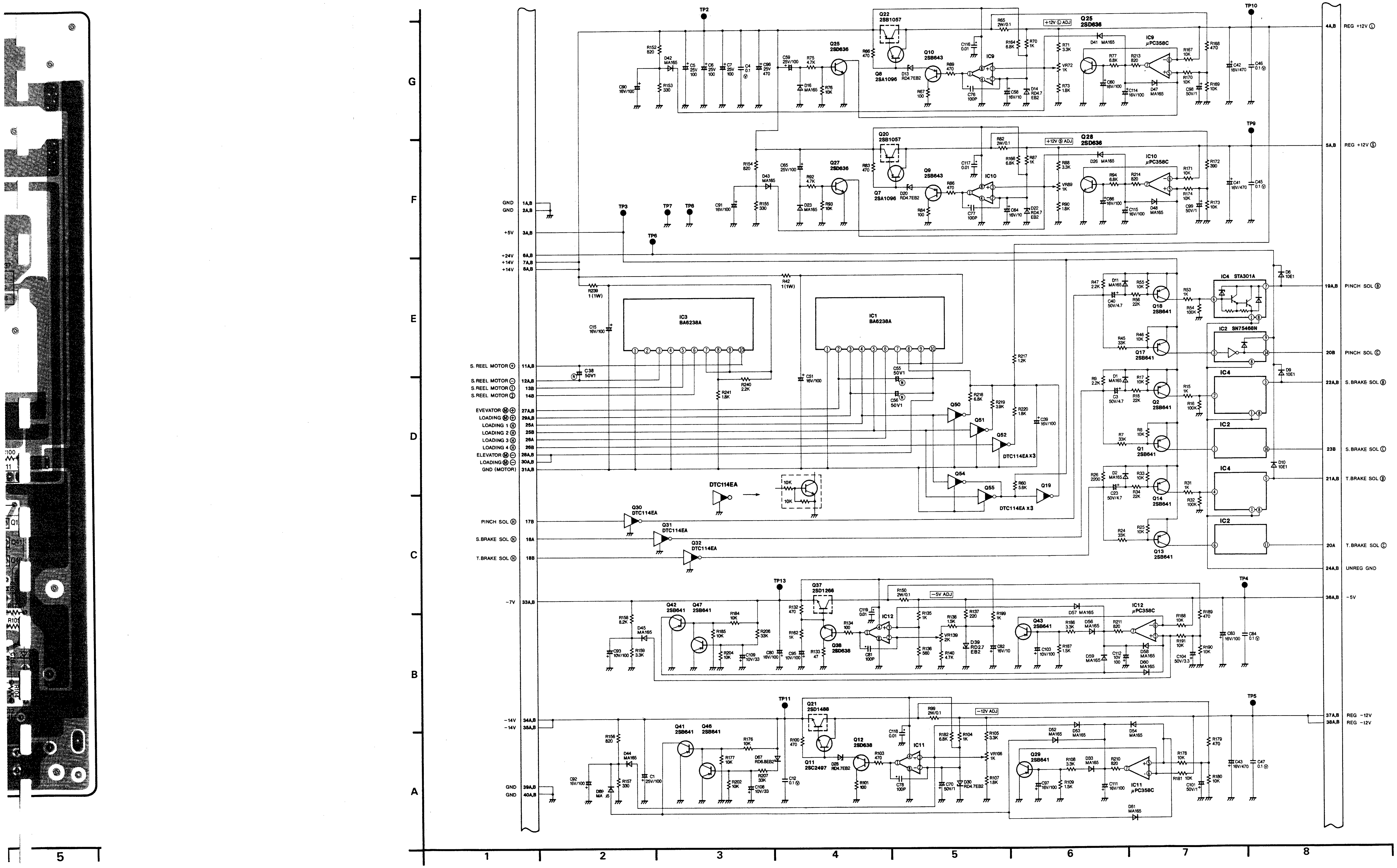
ADDRESS INFORMATION

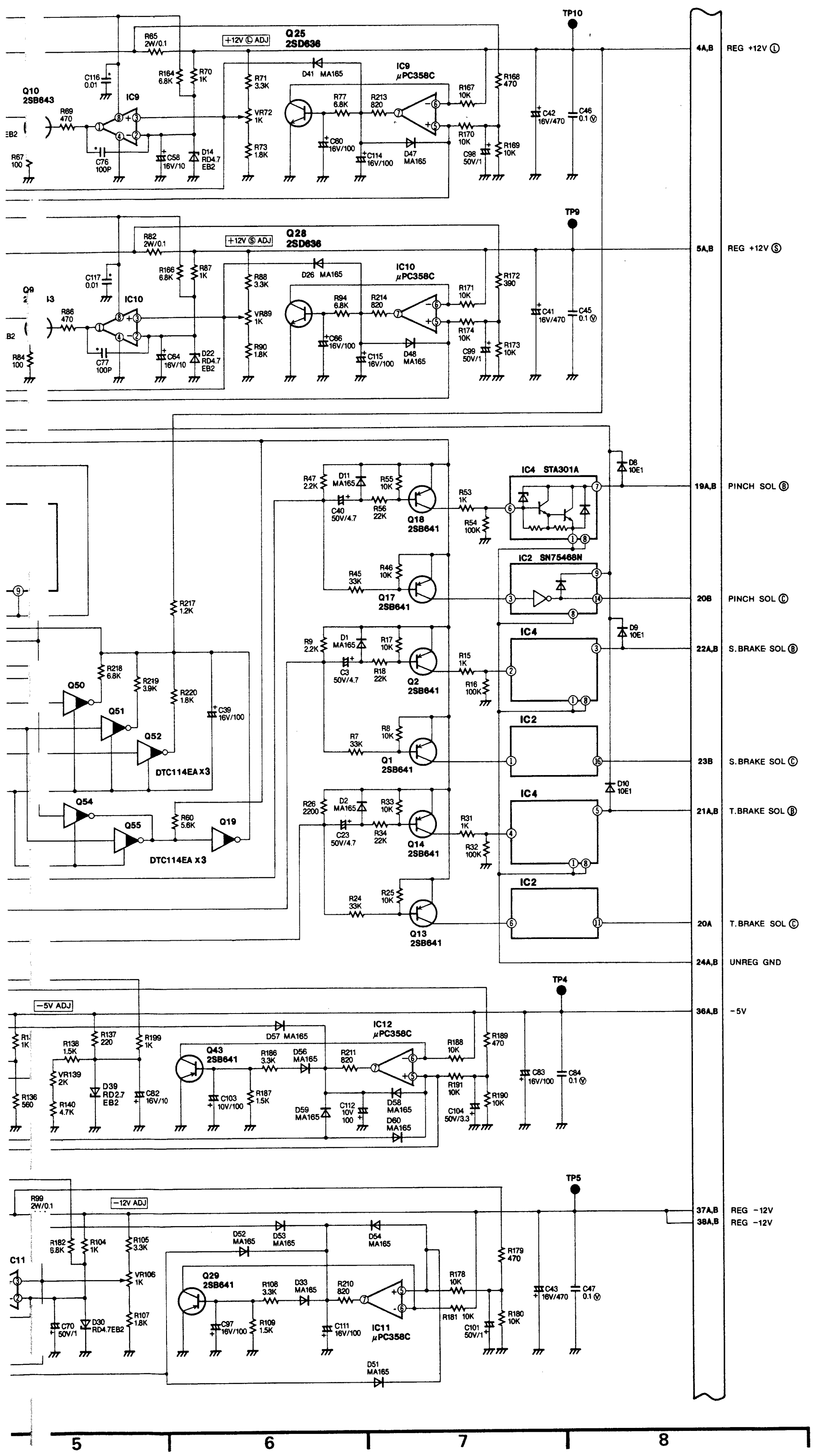


S10 POWER & DI



S10 POWER & DRIVE SCHEMATIC DIAGRAM





S - 10	POWER & DRIVE			
B		NO	A	
S9-1A	–	1	GND	P54-8
	–	2	GND	
S9 –2A	–	3	+5V	P54-6, 7 P65-1
POWER5–5	–	4	REG +12V (L)	P73-1
S9 –3A,4A	–	5	REG +12V (S)	P68-1 P71-3 P65-2
S9–5A POWER3-1	–	6	+24V	P54–5 P73-3 P65-9
POWER4–1	–	7	+14V	
POWER4–2	–	8	+14V	
POWER4–7	–	9	+7V	
	–	10		
	–	11	S REEL MOTOR (+)	P53–1
	–	12	S REEL MOTOR (–)	P53–2
P76–3	S REEL MOTOR (1)	13		
P76–4	S REEL MOTOR (2)	14		
	–	15		
	–	16		
P76–10	PINCH SOL (H)	17		
P78-6	T BRAKE SOL (H)	18	S BRAKE SOL (H)	P76–9
	–	19	PINCH SOL (B)	P53–5
P53–7	PINCH SOL (C)	20	T BRAKE SOL (C)	P53–6
	–	21	T BRAKE SOL (B)	P53–8
	–	22	S BRAKE SOL (B)	P53–9
P53–10	S BRAKE SOL (C)	23		
POWER 3-2	–	24	UNREG GND	P73-4 P75-6, 7
P76–6	LOADING 2 (H)	25	LOADING 1 (H)	P76–5
P76–8	LOADING 4 (H)	26	LOADING 3 (H)	P76–7
	–	27	ELEVATOR (M)(+)	P54–1
	–	28	ELEVATOR (M)(–)	P54–2
	–	29	LOADING (M)(+)	P54–3
	–	30	LOADING (M)(–)	P54–4
	–	31	GND (MOTOR)	
		32		
POWER4–6	–	33	–7V	
POWER4–5	–	34	–14V	
POWER4–5	–	35	–14V	
S9 –37A	–	36	–5V	POWER 5-2
S9 –38A	–	37	REG –12V	P68-2 P65-4, 10
S9 –38A	–	38	REG –12V	P71-4
S9 –39A	–	39	GND	P71-5
S9 –40A	–	40	GND	

To CHASSIS INTERMEDIATE

P53			
S10–11	1	S REEL (M)(+)	P451–1
S10–12	2	S REEL (M)(–)	P451–2
	3		
	4		
S10–19	5	PINCH SOL (B)	P451–5
S10–20A	6	T BRAKE SOL (C)	P451–6
S10–20B	7	PINCH SOL (C)	P451–7
S10–21	8	T BRAKE SOL (B)	P451–8
S10–22	9	S BRAKE SOL (B)	P451–9
S10–23B	10	S BRAKE SOL (C)	P451–10

To CHASSIS INTERMADIATE

P54			
S10–27	1	ELEVATOR (M)(+)	P406–4
S10–28	2	ELEVATOR (M)(–)	P406–5
S10–29	3	LOADING (M)(+)	P452–1
S10–30	4	LOADING (M)(–)	P452–2
S10–6	5	+24V	P452–3
S10–3	6	+5V	P452–4
S10–3	7	+5V	P452–5
S10–1	8	GND	P452–6

To CONTROL VR
To AUDIO VR
To FRONT PANEL INTERMEDIATE
To CONTROL SW

P65			
S10-3	1	+5V	P106-4
S10-5	2	+12V	P101-10
S10-36	3	–5V	P106-5
S10-37	4	–12V	P101-11
S4-26	5	GND	P106-6
S4-11B	6	Y AUTO EQ REF	P108-9
S3-28B	7	C AUTO EQ REF	P108-8
	8		
S10-6	9	+24V	P111-8
S10-37	10	–12V	P151-2

To AUDIO VR
To CONTROL SW
To AUTO OFF LED

P68			
S10-5	1	+12V	P152-1
S10-37	2	–12V	P152-3
S6-32B	3	METER (CH2)	P117-2
S6-33B	4	(GND)	P129-7
S6-34B	5	PB VR (+) (CH2)	P129-5
S6-35B	6	PB VR (–) (CH2)	P129-6
S6-36B	7	MONI OUT (CH2)	P151-5
S6-39B	8	GND	P151-6
S6-1	9	GND	P112-4
S6-1	10	GND	P152-2

P71			
POWER3-1	1	+24V	P331–1
POWER3-2	2		P331–3
S10–5	3	+14	P359–2
S10–38	4	–14	P359–3
S10–39	5	GND	P359–4
S6 –22A	6	MUT (H)	P359–1

To AUDIO MAIN

POWER 3			
S10-6	1	+24V	P211–1
S10-24	2		P211–2

To POWER BOX

P72			
POWER3-1	1	+24V	P212–1
P78-7	2	FAN STOP (L)	P212–2
POWER3-2	3		P212–3

To POWER BOX

P73			
S5–13A	1	REC PCM Y	MULTI-1
S5–13B	2	GND	MULTI-2
S5–34A	3	REC PCM C	MULTI-4
S5–34B	4	GND	MULTI-3

(To MIC JACK)

To L0 (L6)

P75			
S6-6A	1	(T/C GND)	P27-1
S6-7A	2	T/C CUE OUT	P27-2
S6-3	3	S+12V	P32-5
S6-5	4	+24V	P32-6
S6-7B	5	(T/C GND)	P27-3
S9-6AB	6	UNREG GND	P32-8
S9-6AB	7	UNREG GND	P32-9
S6-5	8	+24V	P32-7

To L0

P76			
S6-20A	1	ATT (1)	P35-7
S6-21A	2	ATT (2)	P35-8
S10-13B	3	S REEL MOTOR (1)	P33-3
S10-14B	4	S REEL MOTOR (2)	P33-4
S10-25A	5	LOADING 1 (H)	P33-5
S10-25B	6	LOADING 2 (H)	P33-6
S10-26A	7	LOADING 3 (H)	P33-7
S10-26B	8	LOADING 4 (H)	P33-8
S10-18A	9	S BRK SOL (H)	P33-9
S10-17B	10	PINCH SOL (H)	P33-10

To L0

P78			
S4-29	1	FWD SEARCH (H)	P35-2
S4-30	2	REW SEARCH (H)	P35-3
S3-11	3	SHUTTLE (H)	P35-5
S6-21B	4	$\overline{\text{LOADING MUT}}$	P35-9
	5		
S10-18B	6	T BRK SOL (H)	P35-6
P72-2	7	FAN STOP (L)	P35-10
S4-32	8	Y AGC CP	P26-5
S3-32	9	C CP	P26-6
S6-15A	10	CUE (H)	P32-3

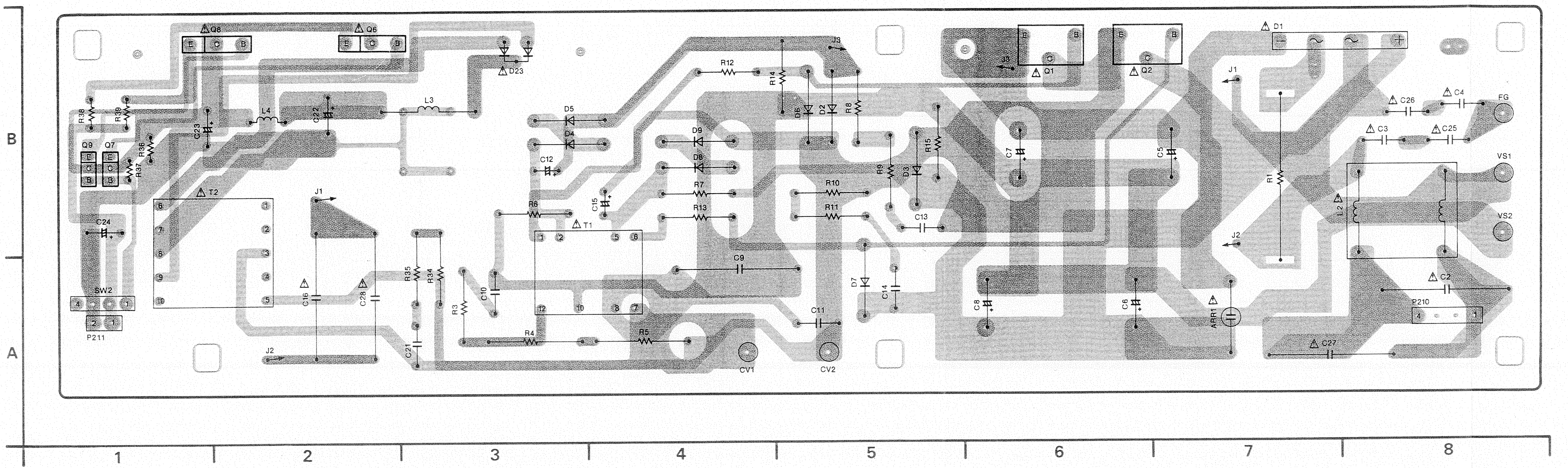
POWER 4			
S10–7	1	+14V	P213–1
S10–8	2	+14V	P213–2
	3	GND	P213–3
	4	GND	P213–4
S10–34,35	5	–14V	P213–5
S10–33	6	–7V	P214–6
S10–9	7	+7V	P214–7

To POWER BOX

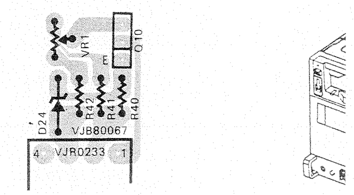
To L0

POWER 5			
S3-38B	1	–12V	POWER2-1
S10-36AB	2	–5V	POWER2-2
	3	GND	POWER2-3
	4	GND	POWER2-4
S10-4B	5	+12V	POWER2-5
	6		
S3-2B	7	+15V	POWER2-7

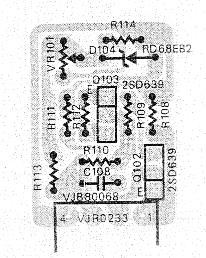
SWITCHING POWER 1 P.C. BOARD (VEP81036A)



SW POWER 1 SUB P.C.B. (VEP80067A) (PART OF VEP81036A)



SW POWER 2 SUB 1 P.C.B. (VEP80068A) (PART OF VEP81037A)



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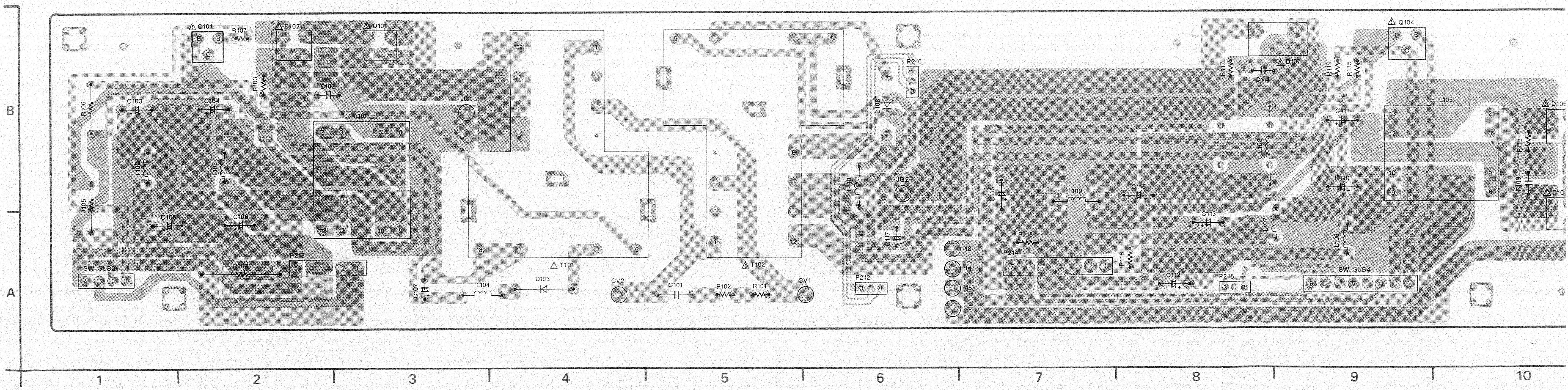
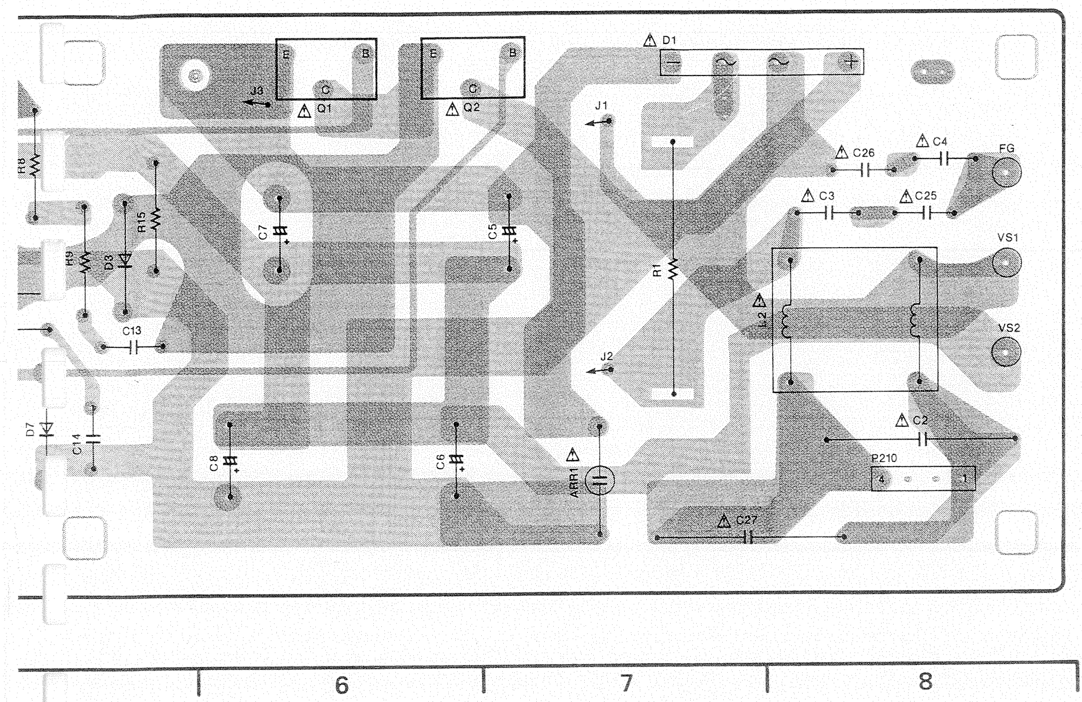
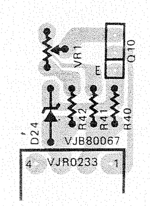
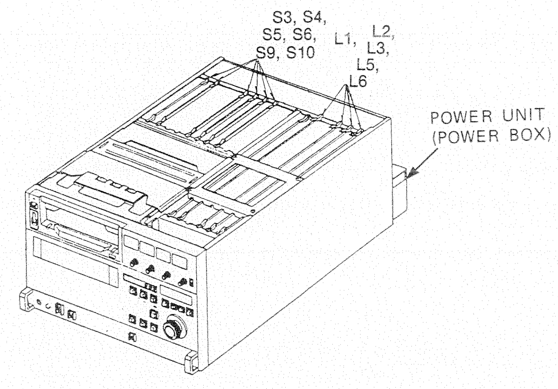


SWITCHING POWER 1/SWITCHING POWEF



SW POWER 1 SUB P.C.B.
(VEP80067A)
(PART OF VEP81036A)





SW POWER 2 SUB 1 P.C.B.
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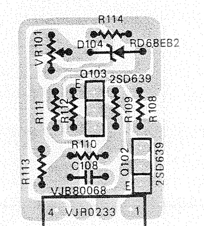
(PART OF VEP81037A)



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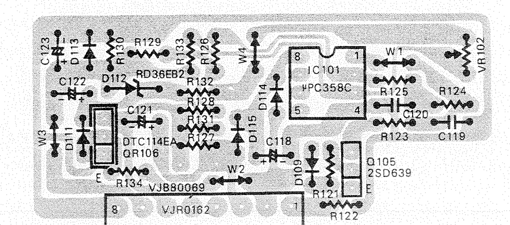
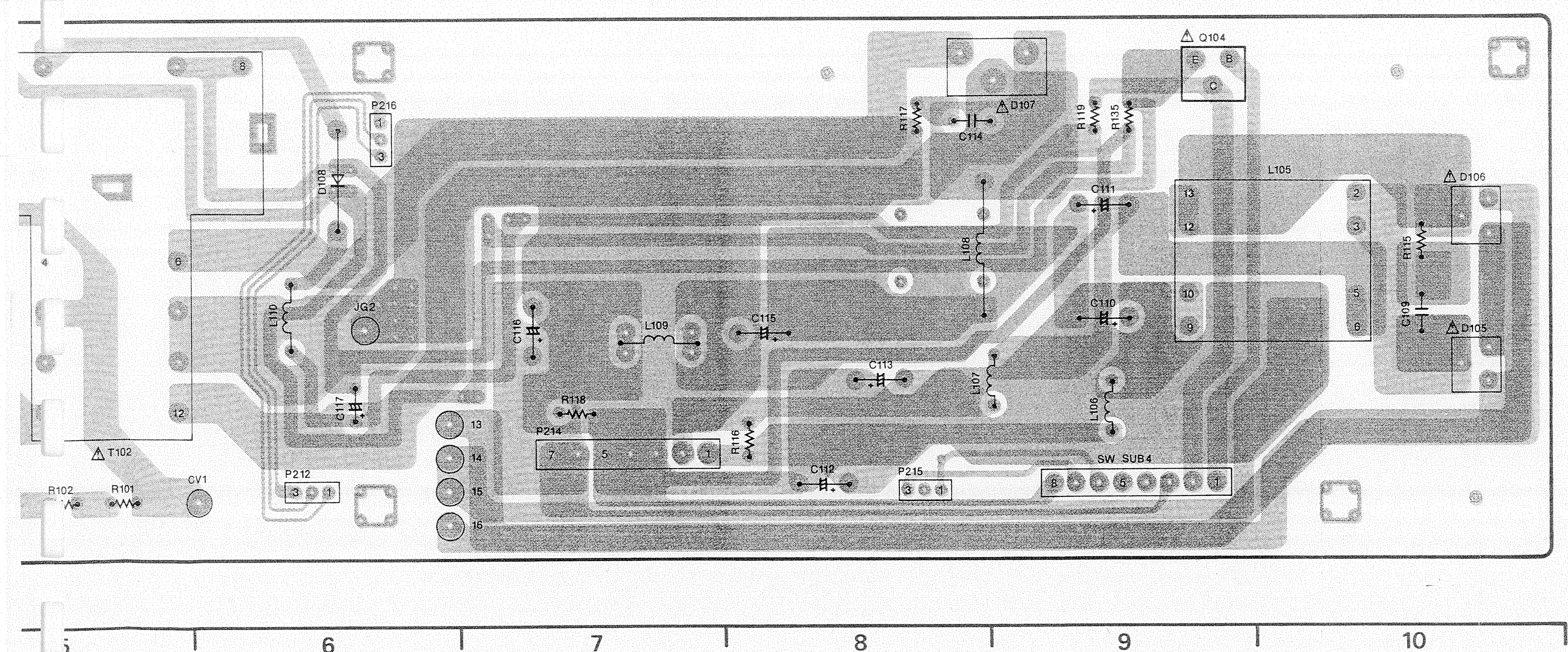
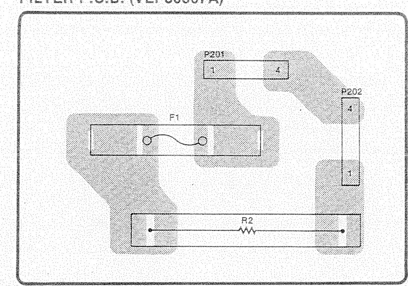
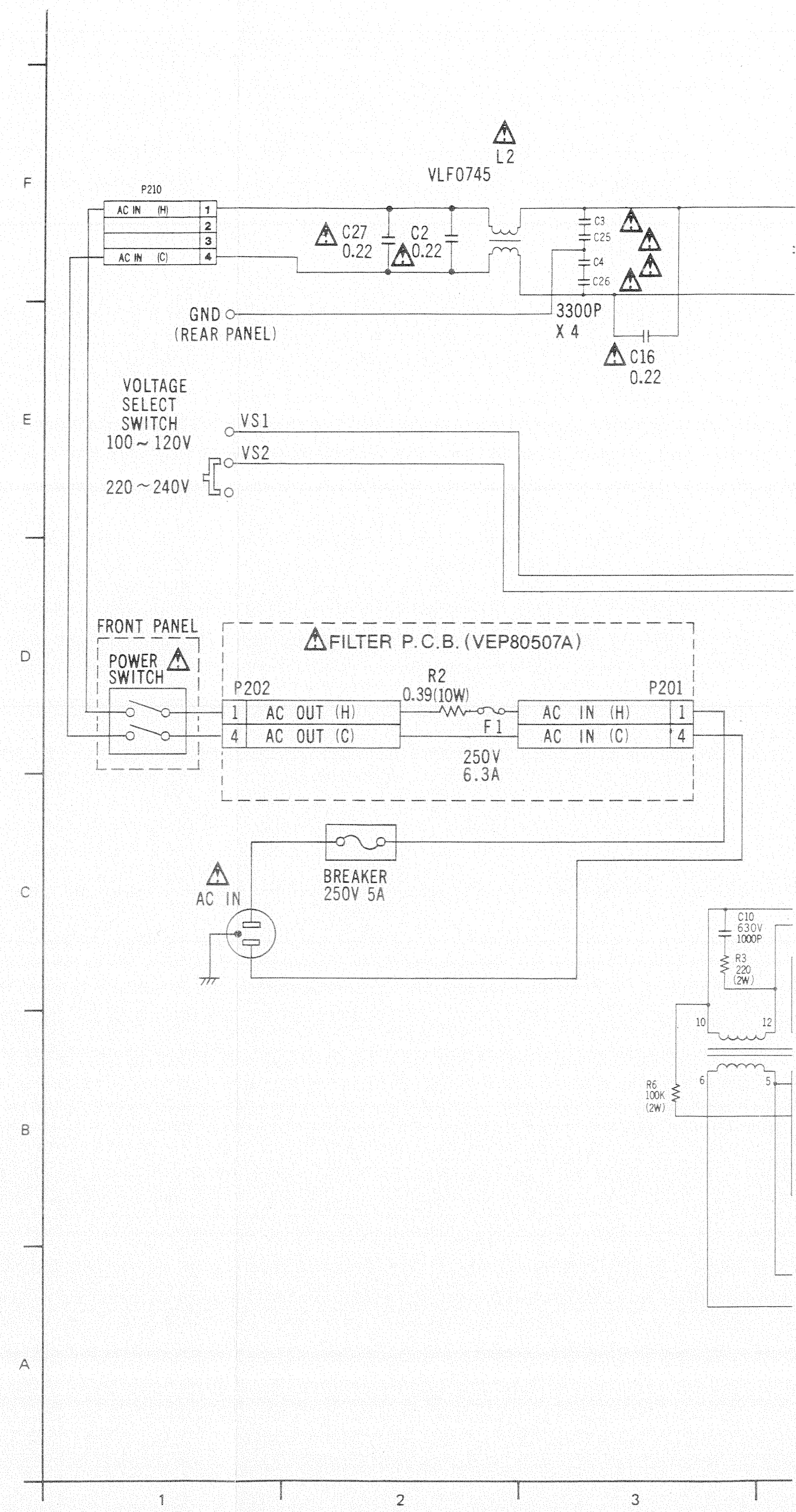


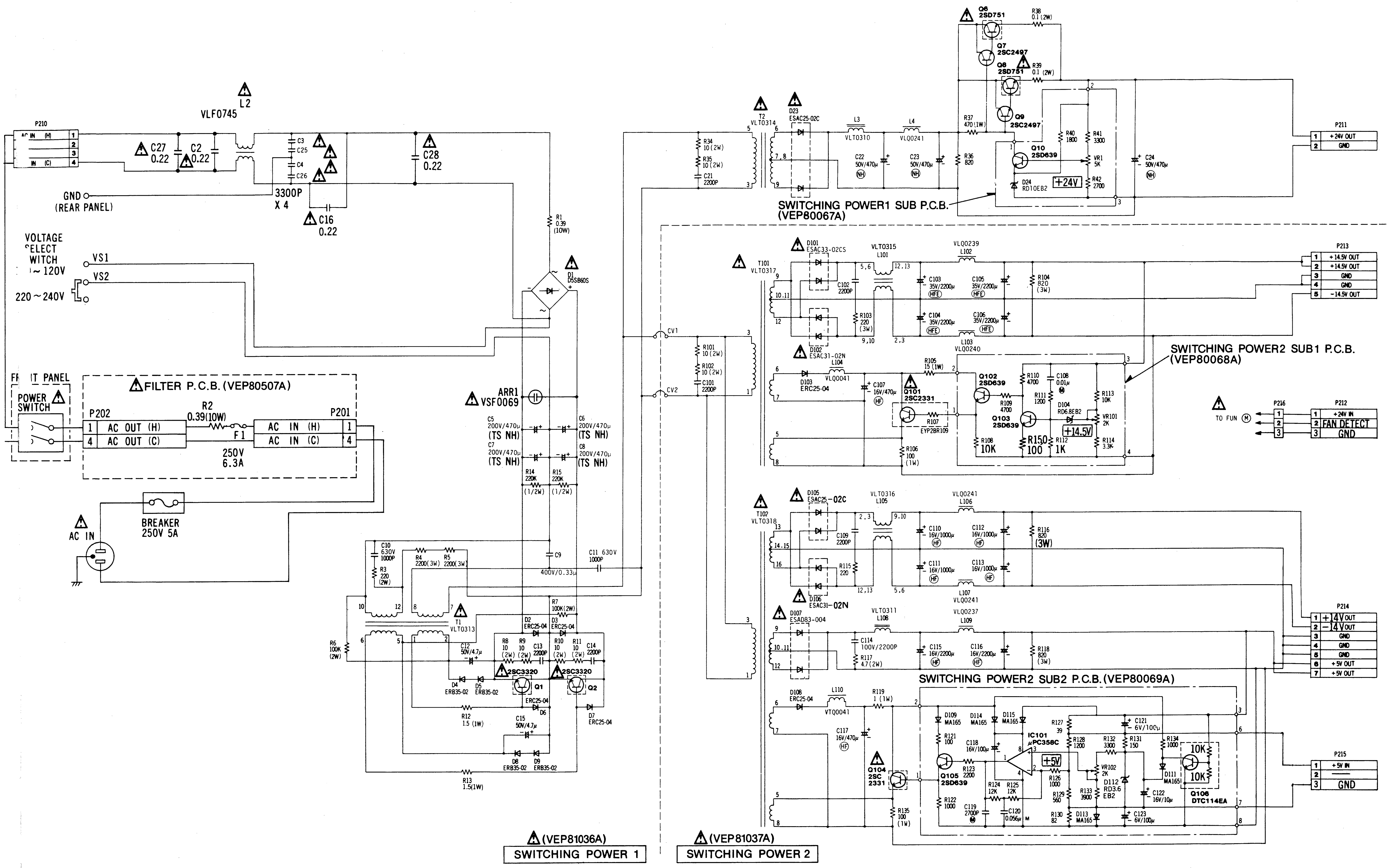


FILTER P.C.B. (VEP80507A)





I' CHING POWER 1/SWITCHING POWER 2 (POWER BOX) SCHEMATIC DIAGRAM



1 2 3 4 5 6 7 8 9 10

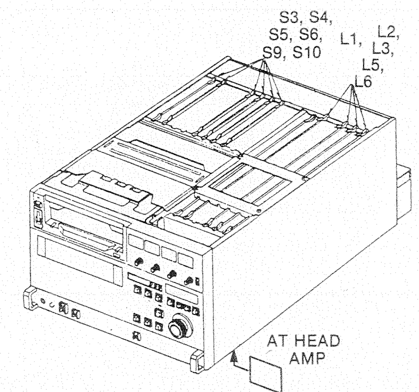
REVERSE SIDE

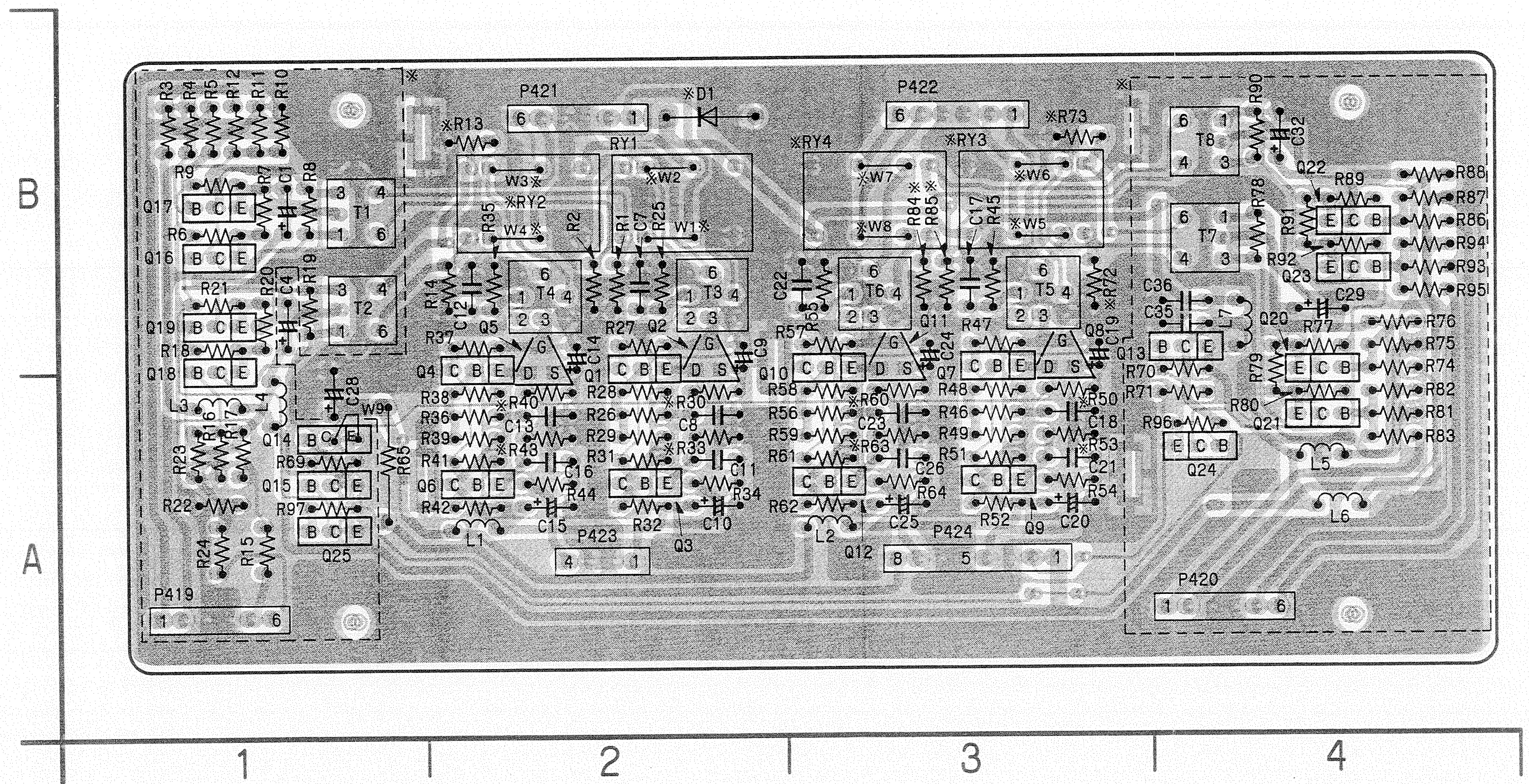
AT HEAD AMP
REMOTE MAIN

AT HEAD AMP P.C. BOARD (VEP85007B)

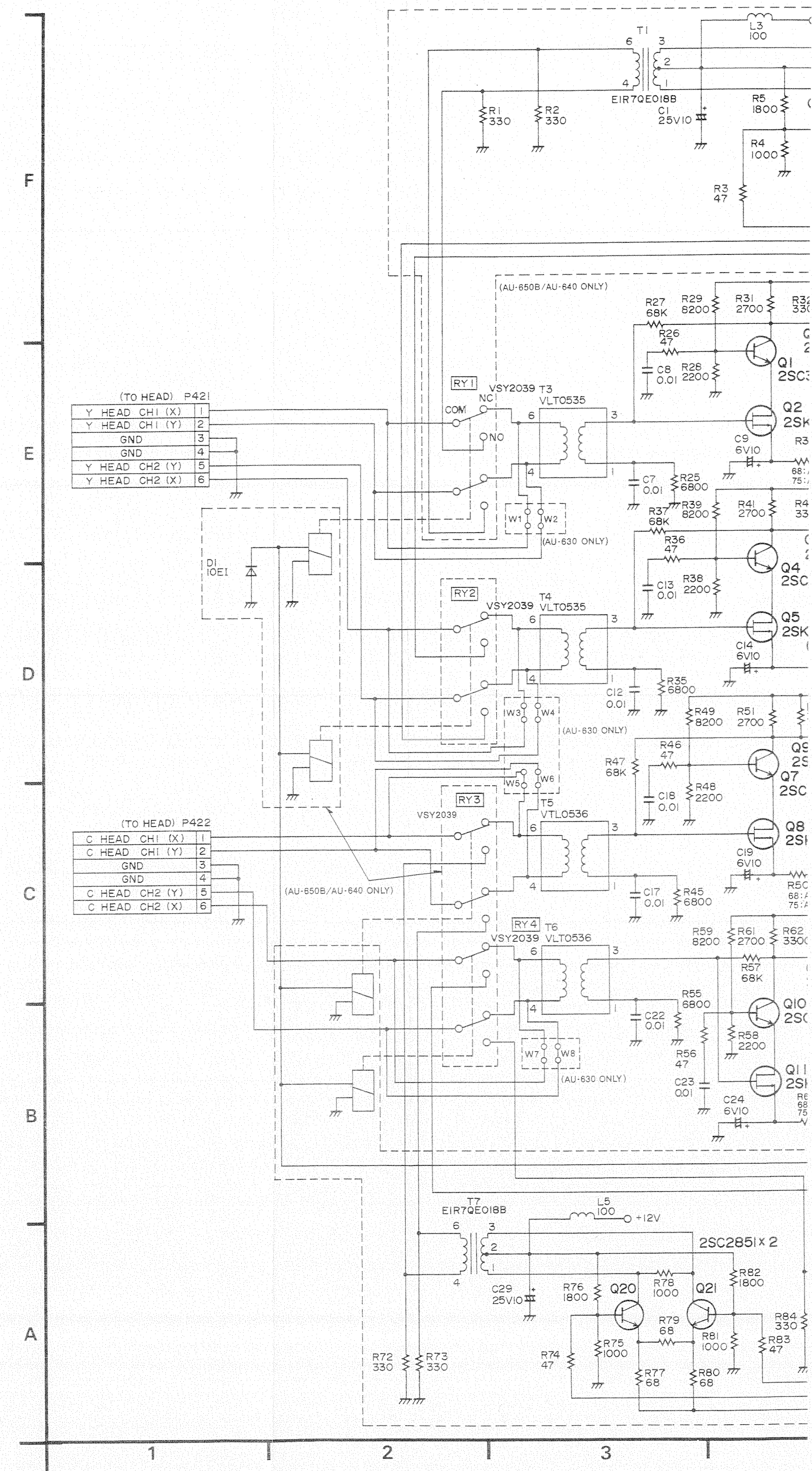
AT HEAD AMP	
Transistors	
Q1	A-2
Q2	B-2
Q3	A-2
Q4	B-2
Q5	B-2
Q6	A-2
Q7	B-3
Q-8	B-3
Q-9	A-3
Q10	B-3
Q11	B-3
Q12	A-3
Q13	B-3
Q14	A-1
Q15	A-1
Q16	B-1
Q17	B-1
Q18	B-1
Q19	B-1
Q20	B-4
Q21	A-4
Q22	B-4
Q23	B-4
Q24	A-4
Q25	A-1

ADDRESS INFORMATION

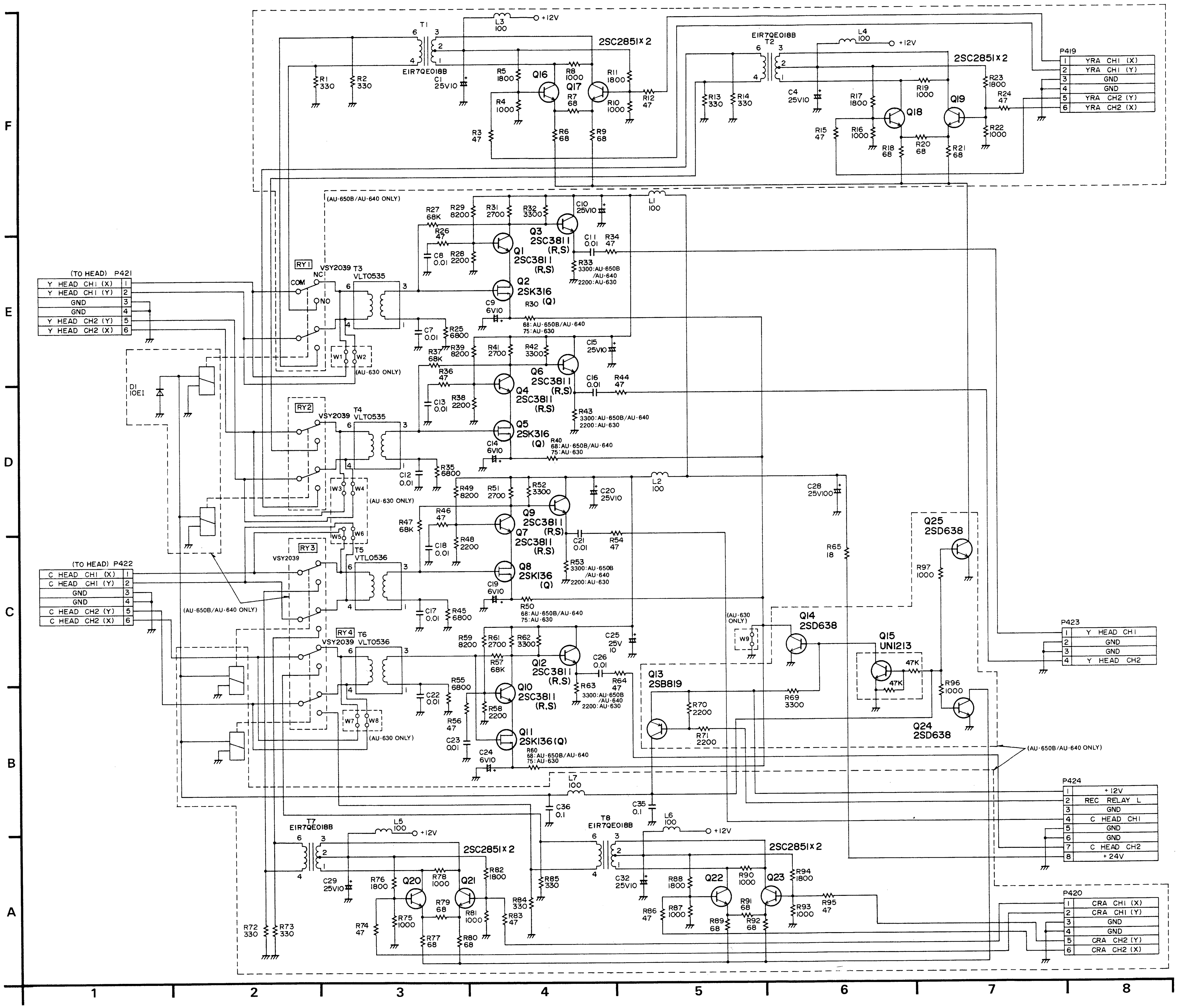




AT HEAD AMP SCHEMATIC DIAGRAM



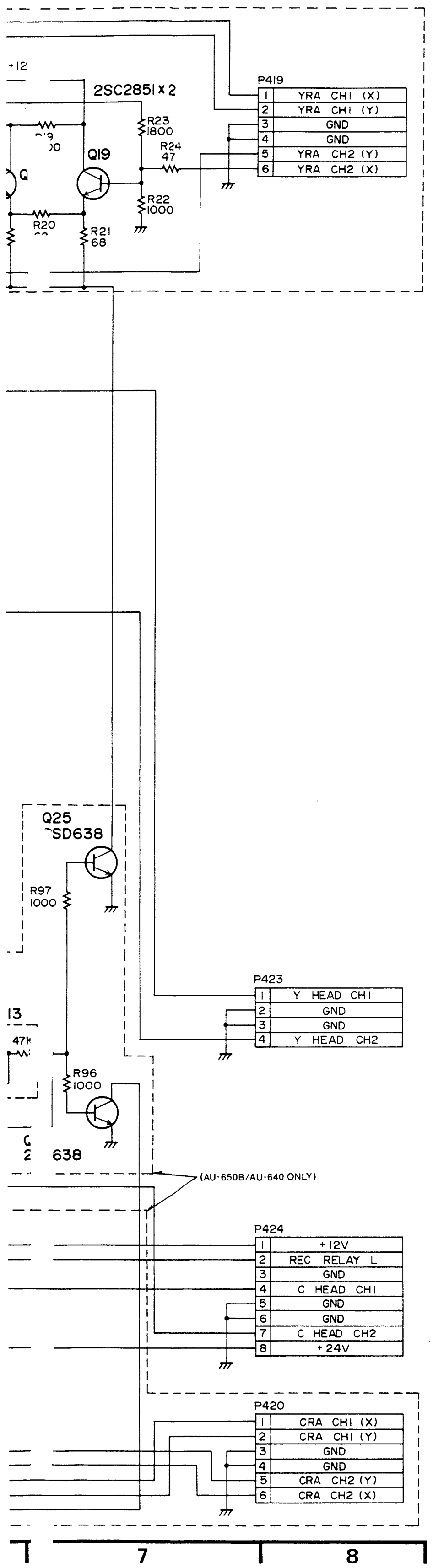
AT HEAD AMP SCHEMATIC DIAGRAM



COMPARISON CHART

	AT HEAD AMP C.B.A.			
	AU-650B	AU-630		AU-650B
C1	25V10	—	R40	68
C4	25V10	—	R43	3300
C29	25V10	—	R50	68
C32	25V10	—	R53	3300
C35	0.1	—	R60	68
C36	0.1	—	R63	3300
D1	10E1	—	R69	3300
L3	100	—	R70	2200
L4	100	—	R71	2200
L5	100	—	R72	3300
L6	100	—	R73	3300
L7	100	—	R74	47
P419	○	—	R75	1K
P420	○	—	R76	1800
Q13	2SB819	—	R77	68
Q14	2SD638	—	R78	1K
Q15	UN1213	—	R79	68
Q16	2SC2851	—	R80	68
Q17	2SC2851	—	R81	1K
Q18	2SC2851	—	R82	1800
Q19	2SC2851	—	R83	47
Q20	2SC2851	—	R84	330
Q21	2SC2851	—	R85	330
Q22	2SC2851	—	R86	47
Q23	2SC2851	—	R87	1K
Q24	2SD638	—	R88	1800
Q25	2SD638	—	R89	68
R1	330	—	R90	1K
R2	330	—	R91	68
R3	47	—	R92	68
R4	1K	—	R93	1K
R5	1800	—	R94	1800
R6	68	—	R95	47
R7	68	—	R96	1K
R8	1K	—	R97	1K
R9	68	—	RY1	VSY2039
R10	1K	—	RY2	VSY2039
R11	1800	—	RY3	VSY2039
R12	47	—	RY4	VSY2039
R13	330	—	T1	EIR7QE018B
R14	330	—	T2	EIR7QE018B
R15	47	—	T7	EIR7QE018B
R16	1K	—	T8	EIR7QE018B
R17	1800	—	W1	—
R18	68	—	W2	—
R19	1K	—	W3	—
R20	68	—	W4	—
R21	68	—	W5	—
R22	1K	—	W6	—
R23	1800	—	W7	—
R24	47	—	W8	—
R30	68	75	W9	—
R33	3300	2200		

○: PART IS MOUNTED
–: PART IS NOT MOUNTED

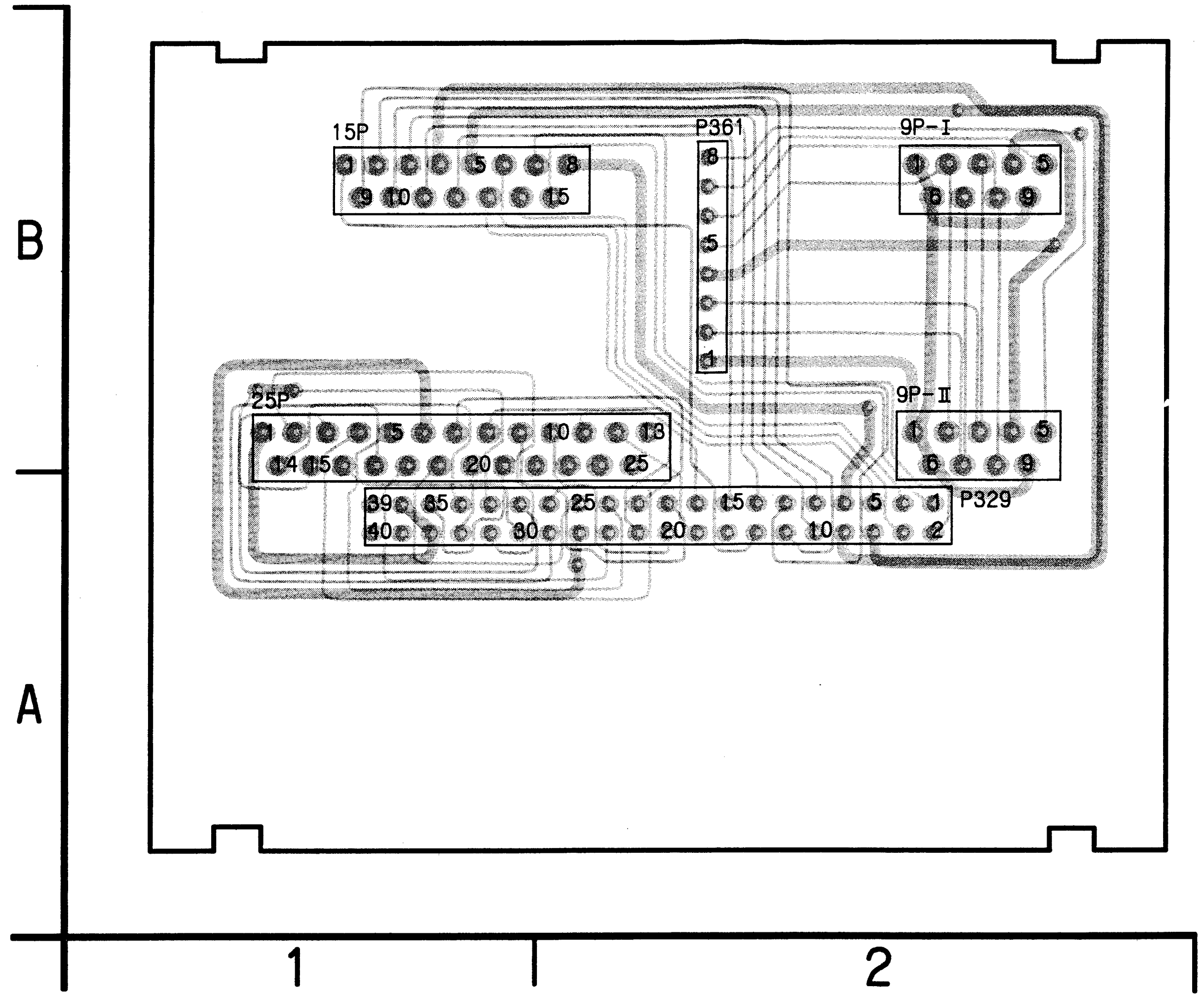


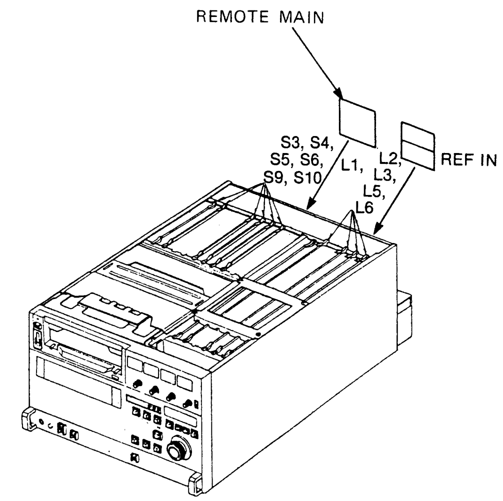
COMPARISON CHART

AT HEAD AMP C.B.A.					
	AU-650B	AU-630		AU-650B	AU-630
C1	25V10	—	R40	68	75
C4	25V10	—	R43	3300	2200
C29	25V10	—	R50	68	75
C32	25V10	—	R53	3300	2200
C35	0.1	—	R60	68	75
C36	0.1	—	R63	3300	2200
D1	10E1	—	R69	3300	—
L3	100	—	R70	2200	—
L4	100	—	R71	2200	—
L5	100	—	R72	3300	—
L6	100	—	R73	3300	—
L7	100	—	R74	47	—
P419	○	—	R75	1K	—
P420	○	—	R76	1800	—
Q13	2SB819	—	R77	68	—
Q14	2SD638	—	R78	1K	—
Q15	UN1213	—	R79	68	—
Q16	2SC2851	—	R80	68	—
Q17	2SC2851	—	R81	1K	—
Q18	2SC2851	—	R82	1800	—
Q19	2SC2851	—	R83	47	—
Q20	2SC2851	—	R84	330	—
Q21	2SC2851	—	R85	330	—
Q22	2SC2851	—	R86	47	—
Q23	2SC2851	—	R87	1K	—
Q24	2SD638	—	R88	1800	—
Q25	2SD638	—	R89	68	—
R1	330	—	R90	1K	—
R2	330	—	R91	68	—
R3	47	—	R92	68	—
R4	1K	—	R93	1K	—
R5	1800	—	R94	1800	—
R6	68	—	R95	47	—
R7	68	—	R96	1K	—
R8	1K	—	R97	1K	—
R9	68	—	RY1	VSY2039	—
R10	1K	—	RY2	VSY2039	—
R11	1800	—	RY3	VSY2039	—
R12	47	—	RY4	VSY2039	—
R13	330	—	T1	EIR7QE018B	—
R14	330	—	T2	EIR7QE018B	—
R15	47	—	T7	EIR7QE018B	—
R16	1K	—	T8	EIR7QE018B	—
R17	1800	—	W1	—	○
R18	68	—	W2	—	○
R19	1K	—	W3	—	○
R20	68	—	W4	—	○
R21	68	—	W5	—	○
R22	1K	—	W6	—	○
R23	1800	—	W7	—	○
R24	47	—	W8	—	○
R30	68	75	W9	—	○
R33	3300	2200			

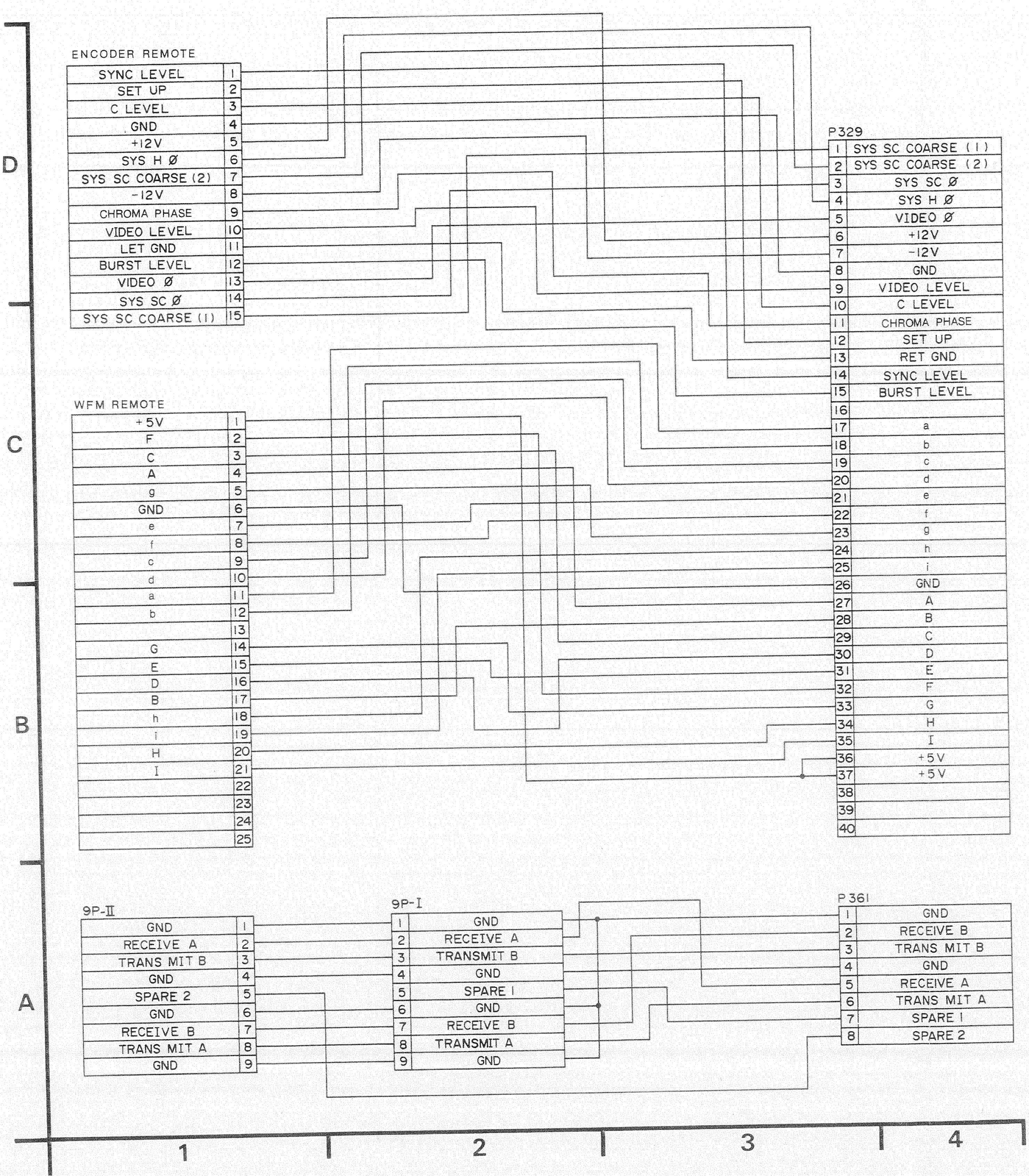
○: PART IS MOUNTED
–: PART IS NOT MOUNTED

REMOTE MAIN P.C. BOARD (VEP80419A)

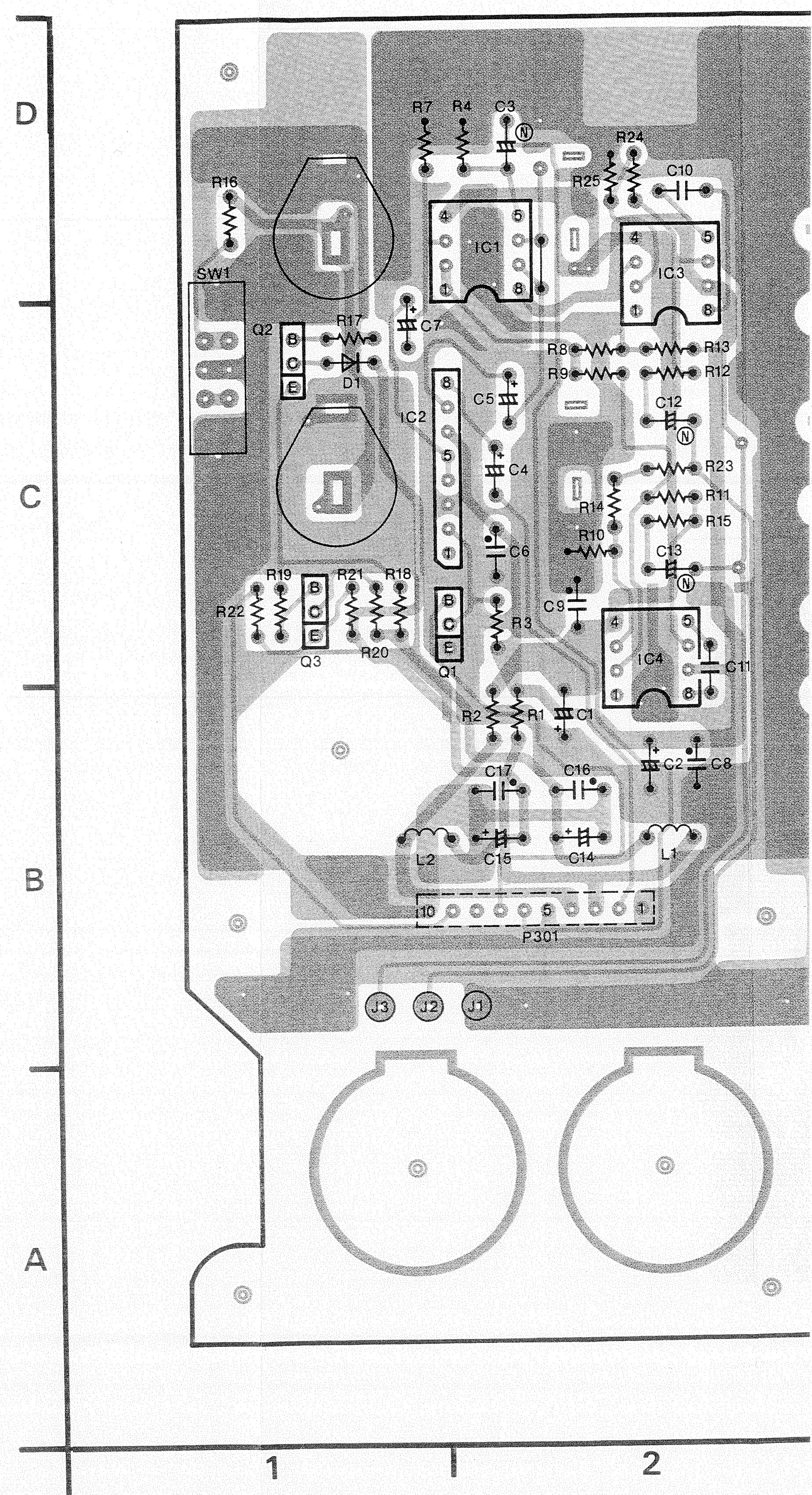




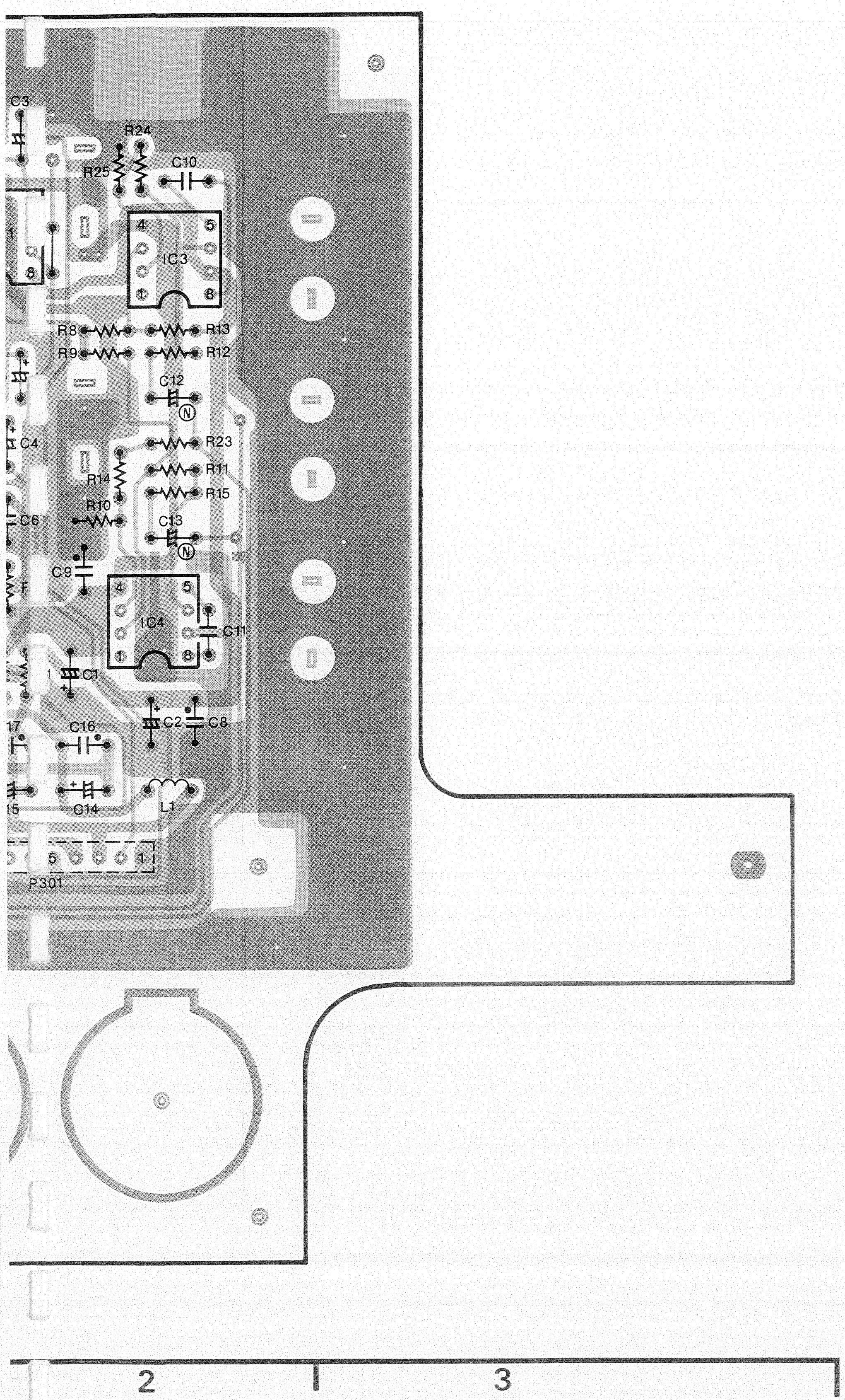
REMOTE MAIN SCHEMATIC DIAGRAM



REF IN P.C. BOARD (VEP80468A)



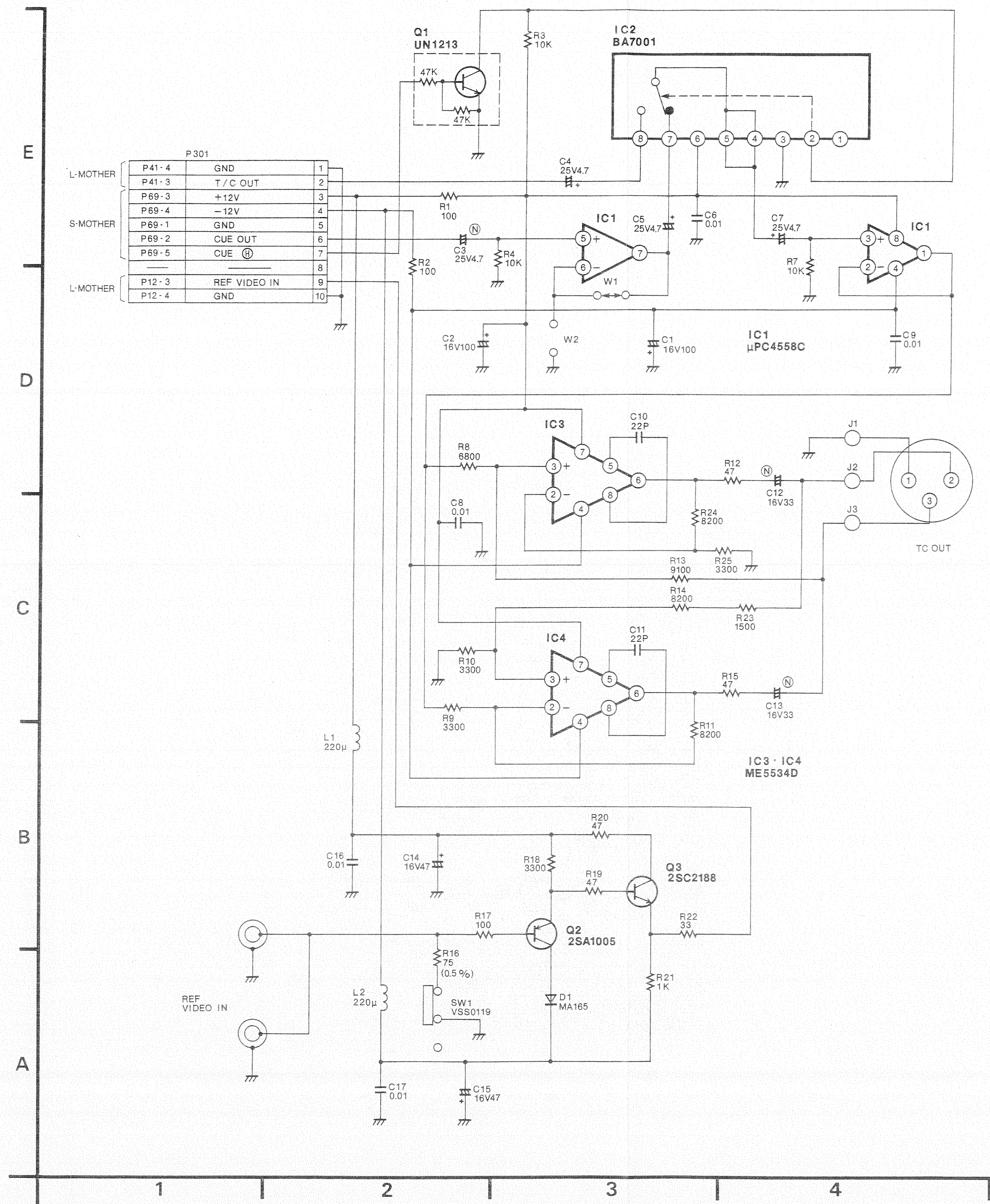
4 8A)



REF IN	
Transistors	
Q1	C-2
Q2	C-1
Q3	C-1
Integrated Circuits	
IC1	C-2
IC2	C-2
IC3	D-2
IC4	B-2

ADDRESS INFORMATION

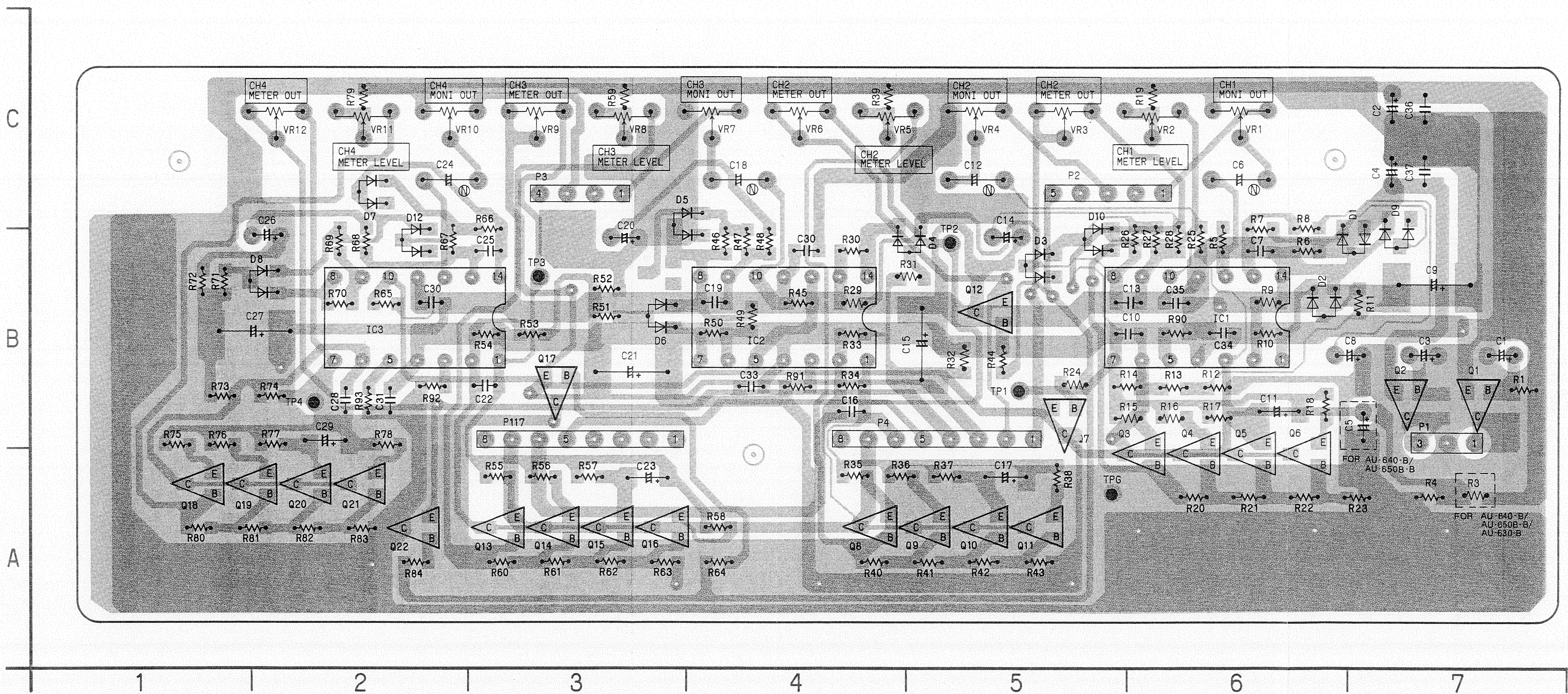
REF IN SCHEMATIC DIAGRAM



PEAK METER P.C. BOARD (VEP80355B) FOR AU-630-E
(VEP80355C) FOR AU-630-B

PEAK METER	
Transistors	
Q1	B-7
Q2	B-7
Q3	B-6
Q4	B-6
Q5	B-6
Q6	B-6
Q7	B-5
Q8	A-4
Q9	A-5
Q10	A-5
Q11	A-5
Q12	B-5
Q13	A-3
Q14	A-3
Q15	A-3
Q16	A-3
Q17	B-3
Q18	A-1
Q19	A-1
Q20	A-2
Q21	A-2
Q22	A-2
Integrated Circuits	
IC1	B-6
IC2	B-4
IC3	B-2
Test Points	
TP1	B-5
TP2	B-5
TP3	B-3
TP4	B-2
TPG	A-5
Adjustments	
VR1	C-6
VR2	C-6
VR3	C-5
VR4	C-5
VR5	C-4
VR6	C-4
VR7	C-4
VR8	C-3
VR9	C-3
VR10	C-2
VR11	C-2
VR12	C-2

ADDRESS INFORMATION



REVERSE SIDE

REMOTE MAIN
REF IN

PEAK

E

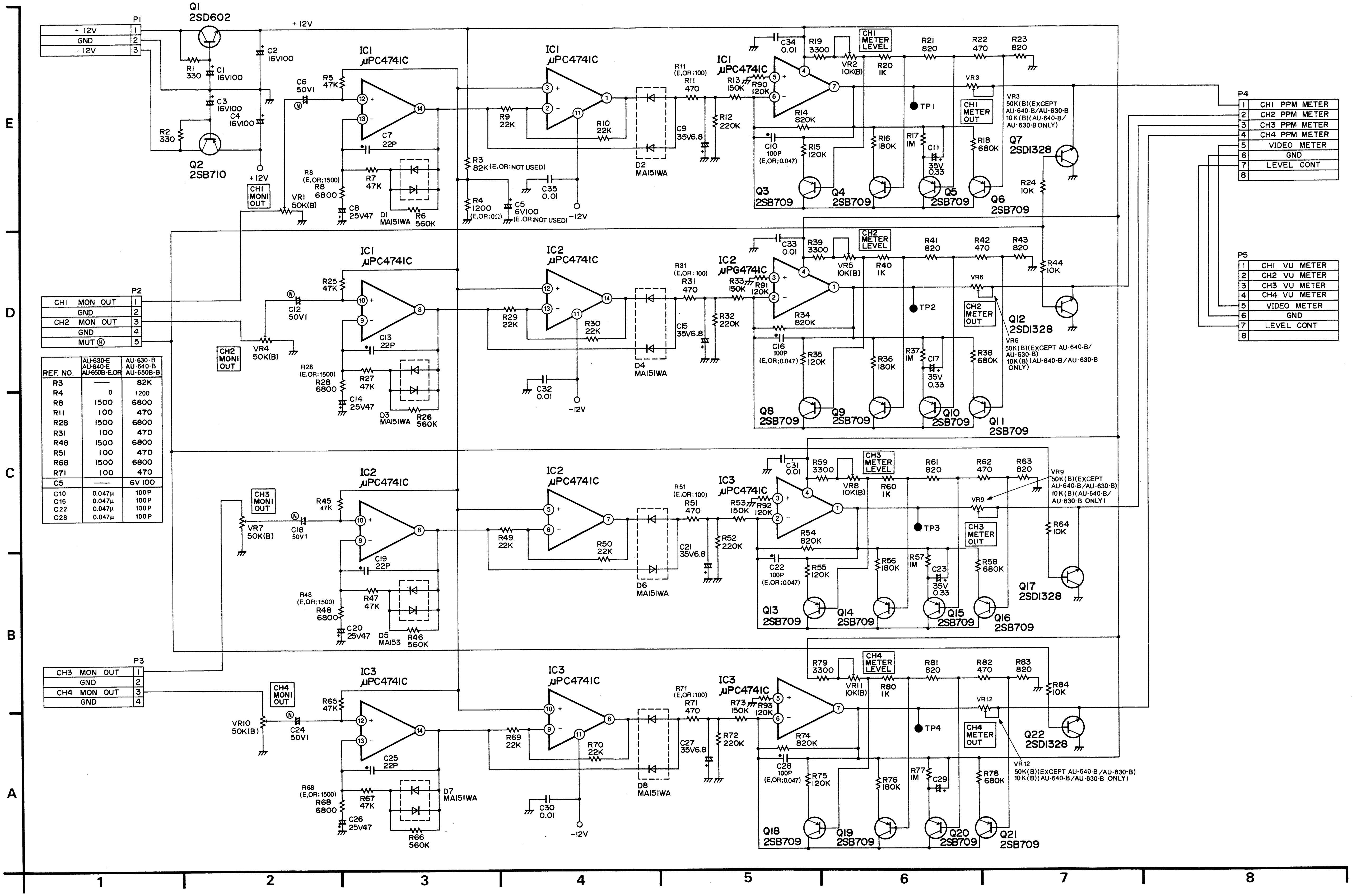
D

C

B

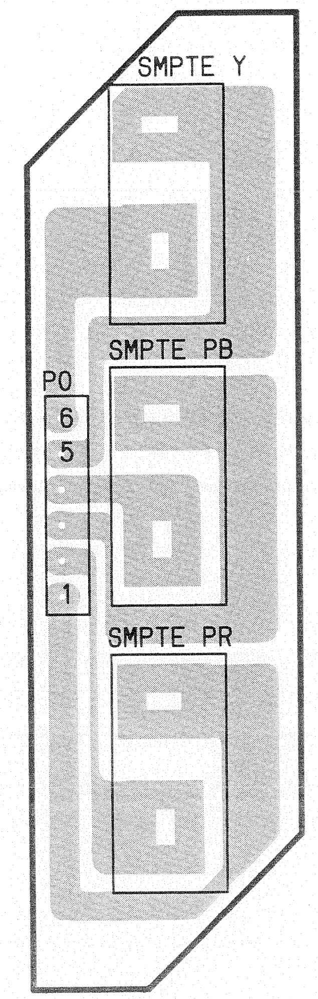
A

PEAK METER SCHEMATIC DIAGRAM

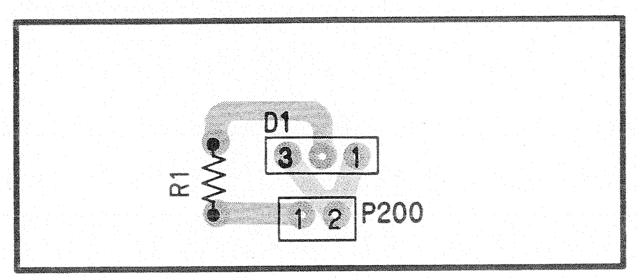


REF. NO.	AU-630-E AU-640-E AU-650B-E,OR	AU-630-B AU-640-B AU-650B-B
R3	——	82K
R4	0	1200
R8	1500	6800
R11	100	470
R28	1500	6800
R31	100	470
R48	1500	6800
R51	100	470
R68	1500	6800
R71	100	470
C5	——	6V 100
C10	0.047µ	100P
C16	0.047µ	100P
C22	0.047µ	100P
C28	0.047µ	100P

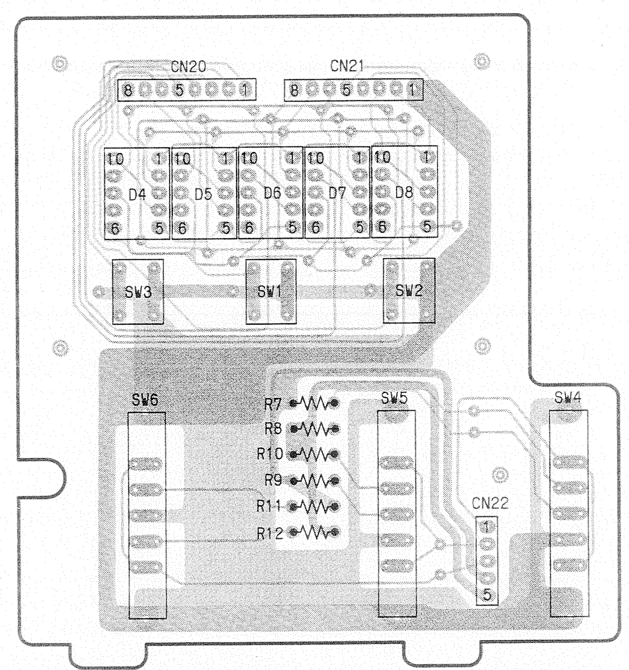
SMPTE OUT P.C.B. (VEP83067A)



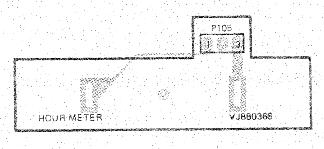
PCM LED P.C.B. (VEP80420A)



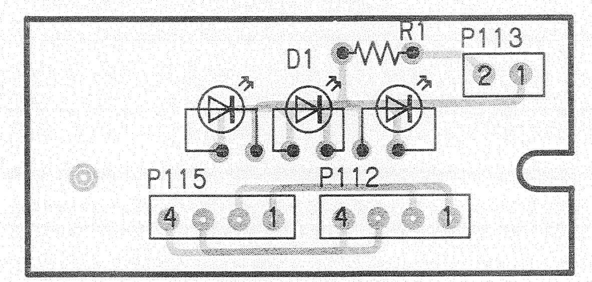
DIGITAL HOUR METER P.C.B. (VEP80390A)



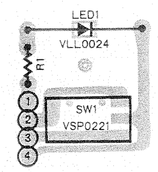
HOUR METER P.C.B. (VEP80368A)



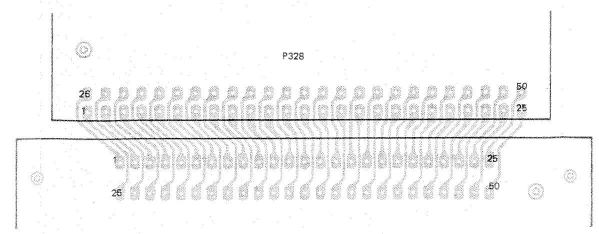
AUTO OFF LED P.C.B. (VEP80422A)



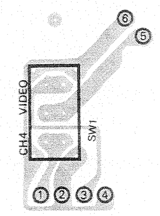
EJECT SW P.C.B. (VEP80232A)



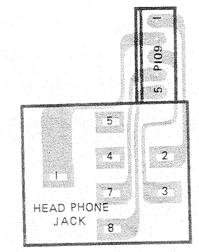
REMOTE 1 P.C.B. (VEP00E13D)



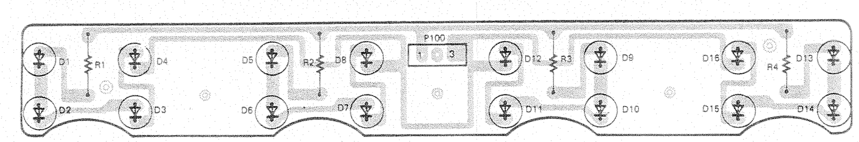
METER SELECT P.C.B. (VEP80083A)

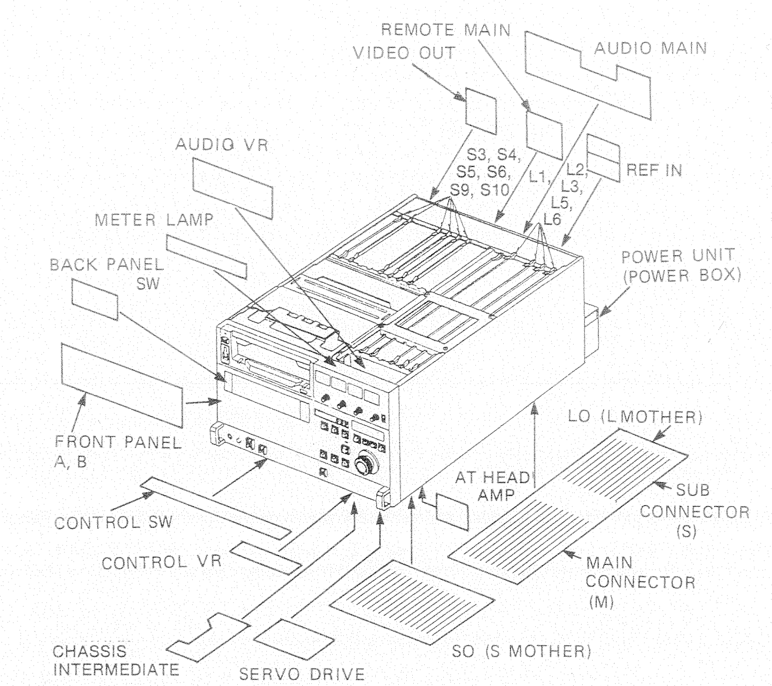


HEADPHONE P.C.B. (VEP80108A)

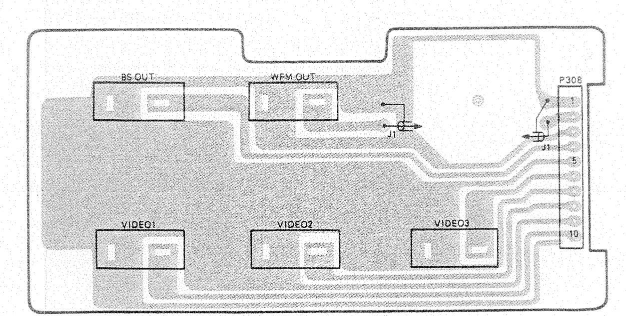


METER LAMP P.C.B. (VEP80333A)

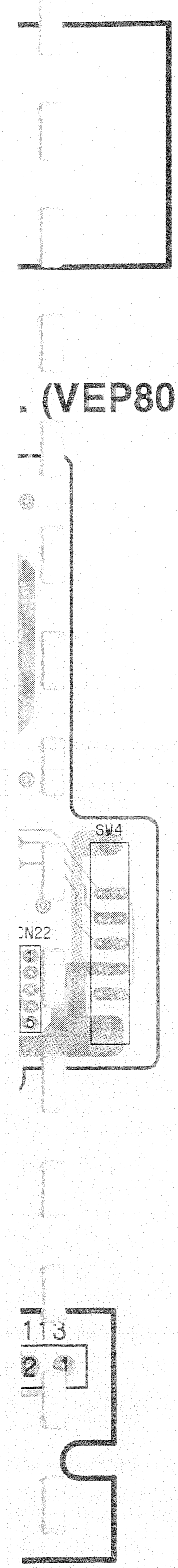




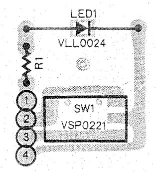
VIDEO OUT P.C.B. (VEP80297A)



. (VEP80390A)



EJECT SW P.C.B. (VEP80232A)



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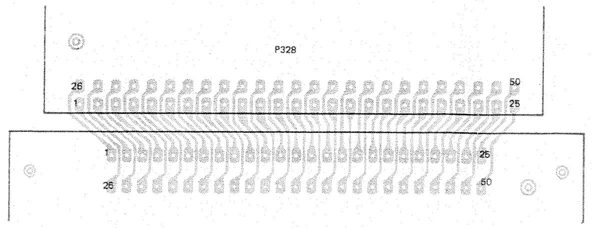
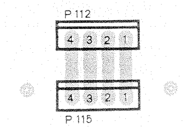
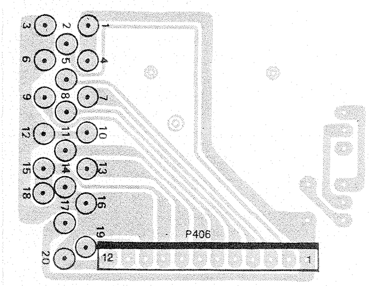


EJECT CONNECT P.C.B. (VEP00E62C)



FRONT LOADING P.C.B. (VEP80440A)



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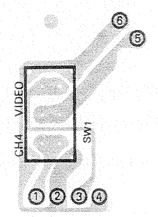
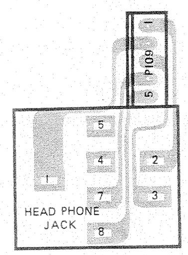
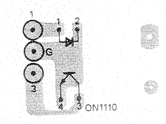


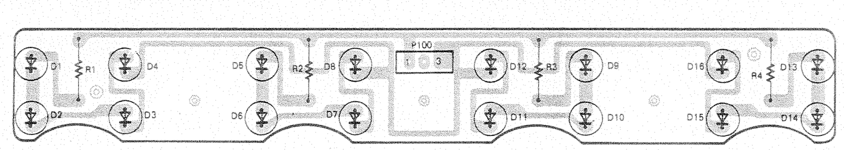
HEADPHONE P.C.B. (VEP80108A)



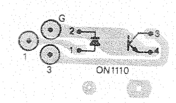
TR SENSOR (1) P.C.B. (VEP00E27A)



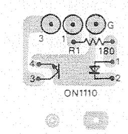
METER LAMP P.C.B. (VEP80333A)

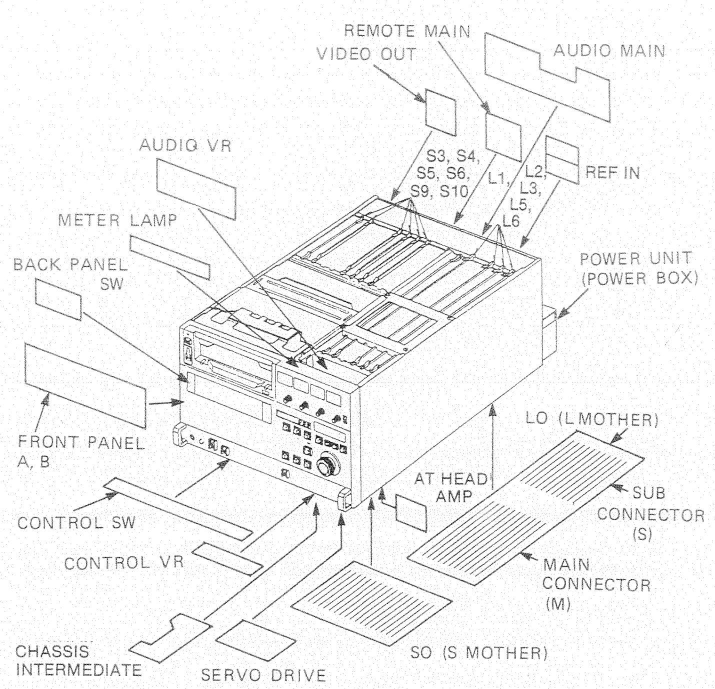


TR SENSOR (2) P.C.B. (VEP00E28A)

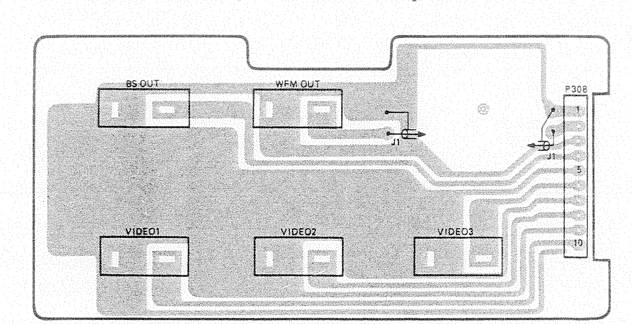


CASSETTE DETECT SWITCH P.C.B. (VEP00E30A)

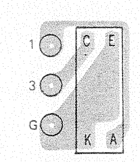




VIDEO OUT P.C.B. (VEP80297A)



LOADING PHOTO P.C.B. (VEP00E04A)



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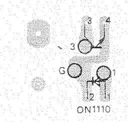

Exploded View
Mechanical Parts List
Electrical Parts List

Note :

1. *Be sure to make your orders of replacement parts according to this list.
2. Unless otherwise specified, all resistors are in OHMS, K = 1,000 OHMS, all capacitors are in MICROFARADS (μF), P = $\mu\mu$ F.
3. The P.C.Board units marked with "■" show below the main assembled parts.
4. The parts marked with Ⓔ on the exploded view show the electric parts.
5. IMPORTANT SAFETY NOTICE
   Components identified with the mark 〈 ! 〉 have the special characteristics for safety. When replacing any of these components, use only the same type.

‹‹ Abbreviations for part ››

‹ NAME ›		‹ DESCRIPTIONS ›
C.CAPACITOR	:	CERAMIC CAPACITOR
C.CAPACITOR CH	:	CERAMIC CHIP CAPACITOR
E.CAPACITOR	:	ELECTROLYTIC CAPACITOR
G.CAPACITOR	:	GLASS CAPACITOR
M.CAPACITOR	:	MICA CAPACITOR
P.CAPACITOR	:	PLASTIC FILM CAPACITOR
S.CAPACITOR	:	SEMI-CONDUCTOR CAPACITOR
T.CAPACITOR	:	TANTALUM CAPACITOR
TRIMMER	:	TRIMMER
C.RESISTOR	:	CARBON RESISTOR
F.RESISTOR	:	FUSE RESISTOR
M.RESISTOR	:	METAL OXSIDE RESISTOR
M.RESISTOR CH	:	METAL OXSIDE CHIP RESISTOR
S.RESISTOR	:	SOLID RESISTOR
V.RESISTOR	:	VARIABLE RESISTOR
W.RESISTOR	:	WIRE WOUND RESISTOR
COMBI.TR-R	:	TRANSISTOR-RESISTOR COMBINATION PARTS
COMBI.R-R	:	RESISTOR-RESISTOR COMBINATION PARTS
COMBI.C-R	:	CAPACITOR-RESISTOR COMBINATION PARTS
COMBI.C-R-R	:	CAPACITOR-RESISTOR-COIL COMBINATION PARTS
P.C.BOARD	:	PRINTED CIRCUIT BOARD
W/COMPONENT	:	WITH COMPONENT

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Mechanical Chassis Assembly (2) ...5-8
Mechanical Chassis Assembly (3) ...5-10
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Cassette Compartment Assembly 5-14
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Y PB P.C.B.(S4,VEP83063B) 5-57
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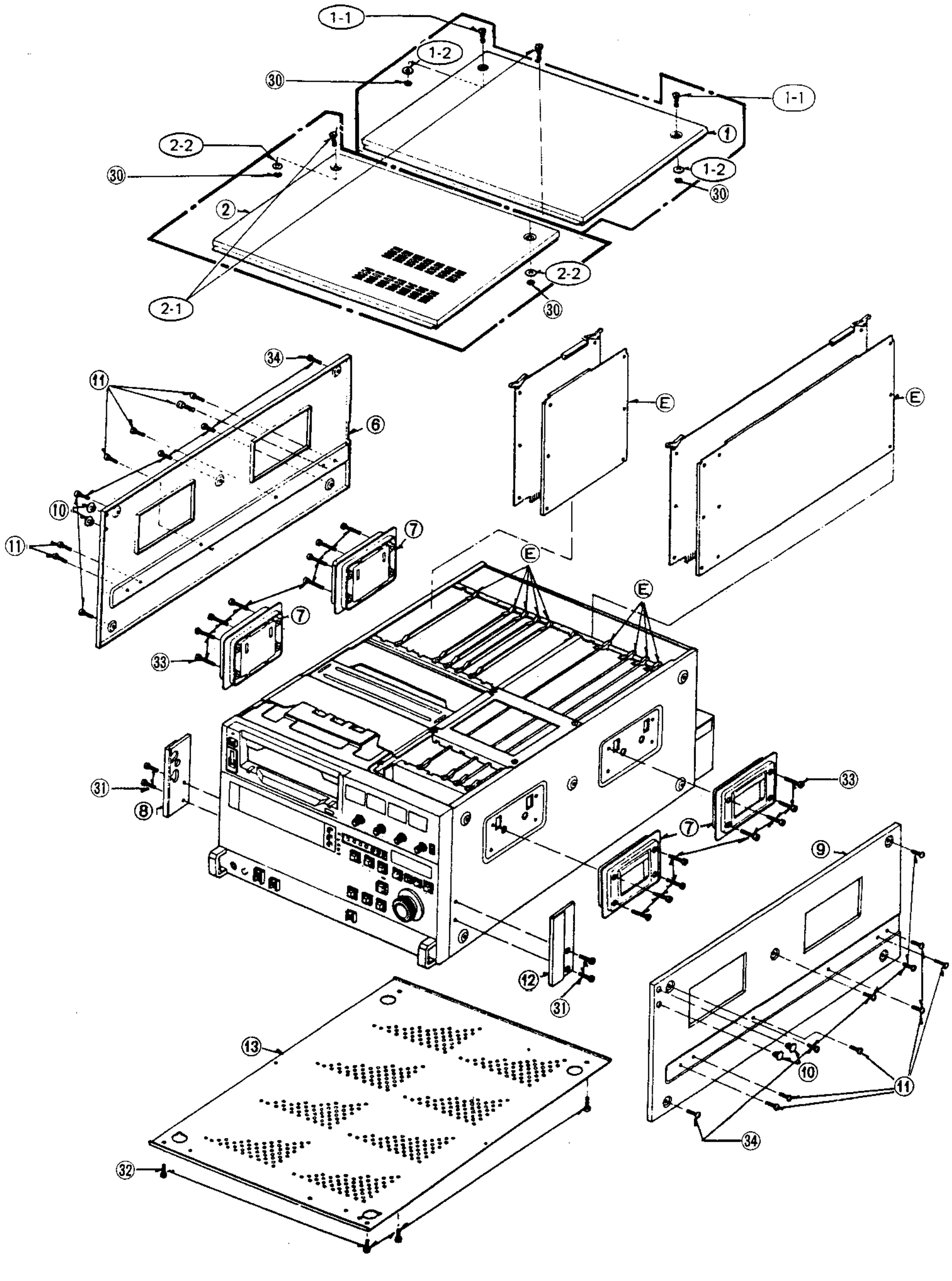
MECHANICAL REPLACEMENT PARTS LIST

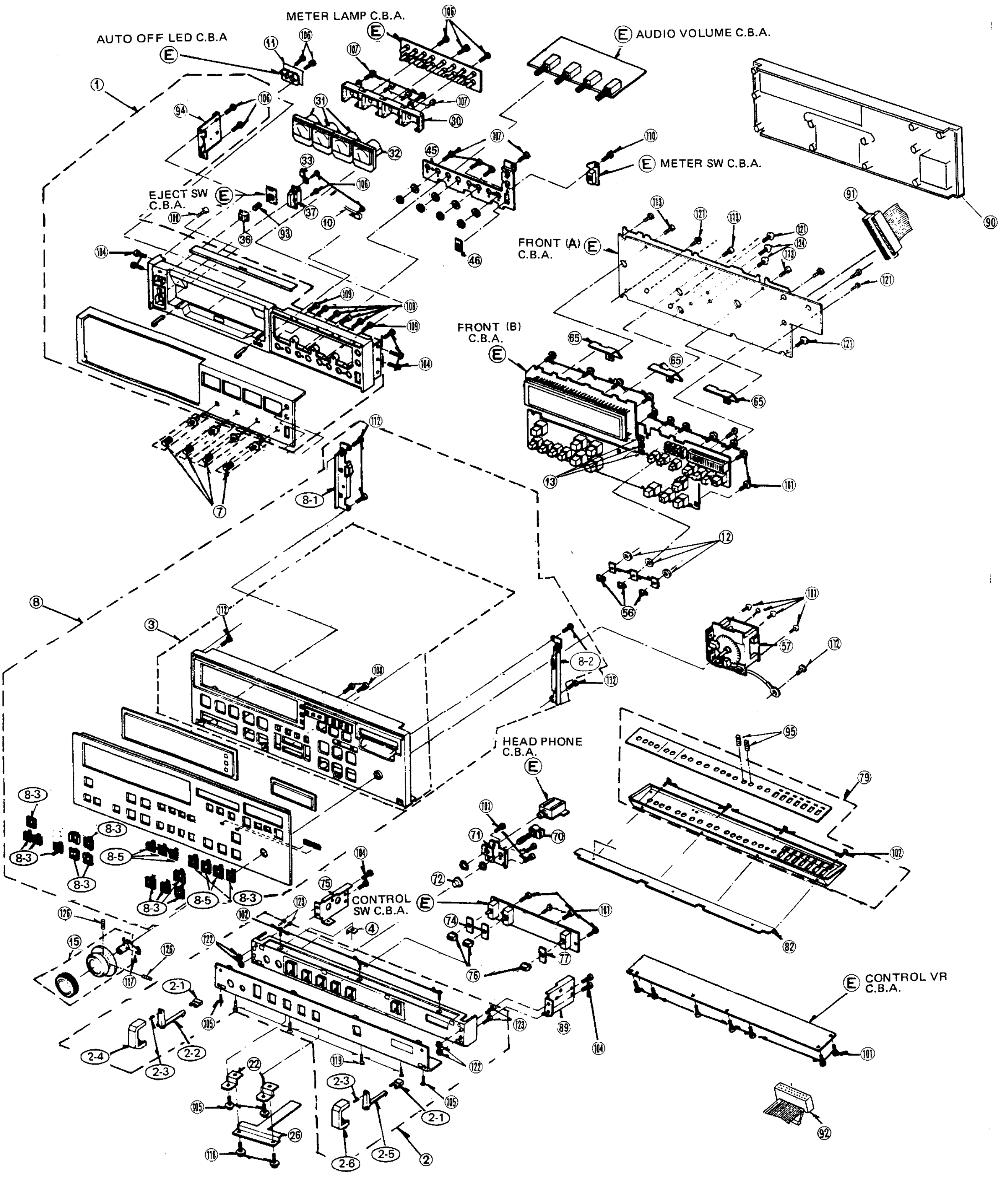
Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VYP2281	REAR TOP COVER U	1	
1-1		VHD0274	SCREW	2	
1-2		VMX0835	SPACER	2	
2		VYP2285	FRONT TOP COVER U	1	
2-1		VHD0274	SCREW	2	
2-2		VMX0835	SPACER	2	
6		VGM0185	SIDE COVER (L)	1	
7		VKH0154	HANDLE	4	
8		VYK1492	PANEL SIDE PLATE (L) U	1	
9		VGM0186	SIDE COVER (R)	1	
10		VMG0277	RUBBER CAP	4	
11		VHD0153	SCREW	12	
12		VYK1491	PANEL SIDE PLATE (R) U	1	
13		VGM0104	BOTTOM PLATE	1	
30		XUC3FP	WASHER	4	
31		XTV3+6F	SCREW	4	
32		XSB3+6S	SCREW	4	
33		XSB4+16FCS	SCREW	16	
34		XSB4+8FCS	SCREW	10	

To guarantee the FUNCTION, SAFETY and RELIABLITY of repaired units, only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

FRAME ASSEMBLY (1)



FRONT PANEL ASSEMBLY

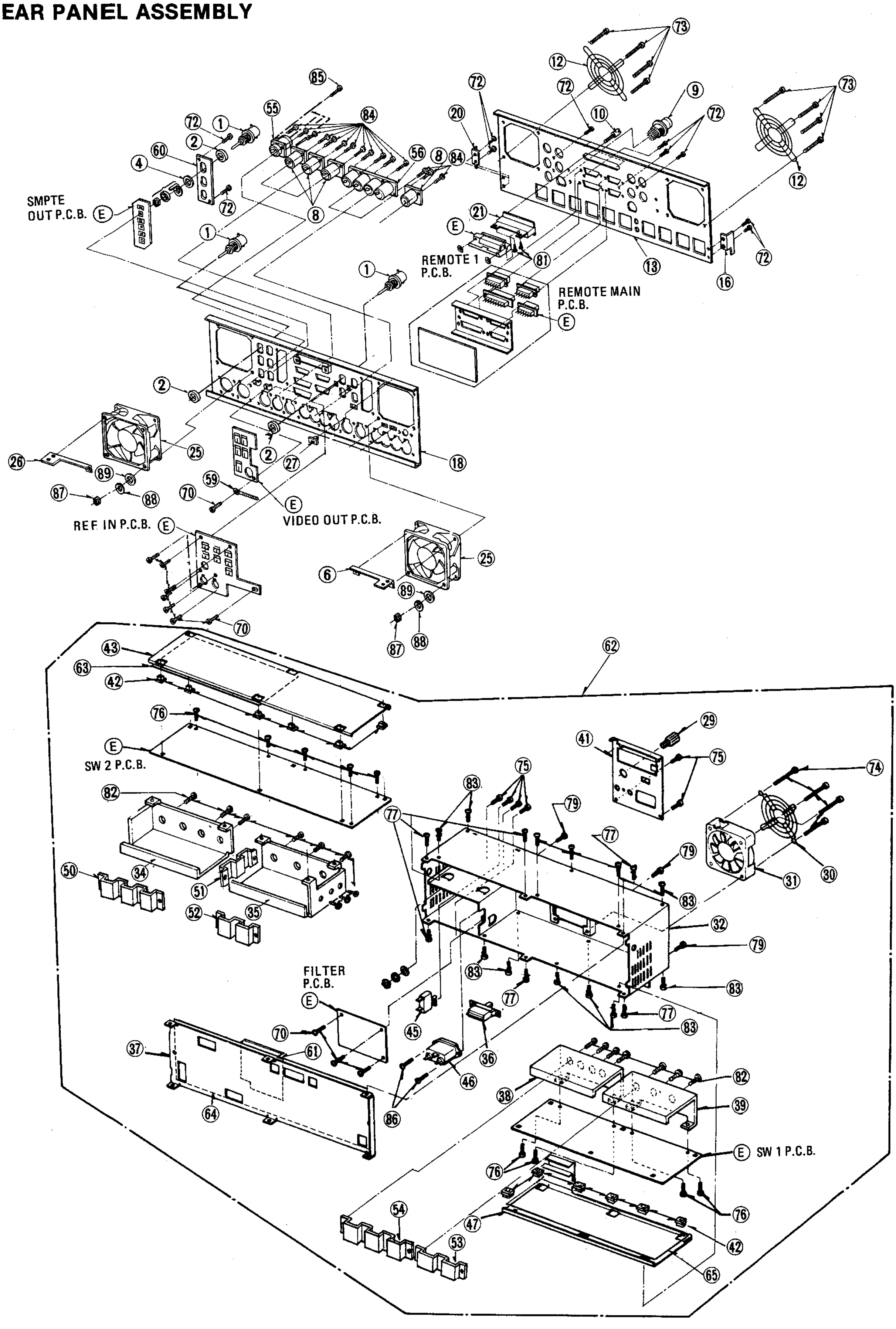


FRONT PANEL ASSEMBLY

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VYP2773	UPPER FRONT PANEL	1	
2		VYP2754	CONTROL PANEL U	1	
2-1		VGF0147	HANDLE COVER	2	
2-2		VML1657	LOCK RELEASE LEVER (L)	1	
2-3		VMB1333	SPRING	2	
2-4		VKH0111	HANDLE (L)	1	
2-5		VML1656	LOCK RELEASE LEVER (R)	1	
2-6		VKH0110	HANDLE (R)	1	
3		VYP2771	FRONT PANEL (2) U	1	
4		VMP0932	PANEL EARTH PLATE	1	
7		VXU0768	VOLUME U (2)	4	
8		VYP2757	FRONT PANEL (U)	1	
8-1		VMP0562	PANEL HOLDER ANGLE (L)	1	
8-2		VMP0561	PANEL HOLDER ANGLE	1	
8-3		VGK1595	SWITCH GUARD	14	
8-5		VGK1512	SWITCH GUARD	13	
10		VJR3	CLAMPER	1	
12		VMX1072	SWITCH SPACER	3	
13		VGU4359	PUSH SWITCH KNOB	3	
15		VXU0767	SEARCH DIAL KNOB U	1	
22		VMP1061	GUIDE HOLDER ANGLE	2	
26		VMP0861	GUIDE ANGLE	1	
30		VGQ1051	METER COVER	1	
31		VSE0091	AUDIO METER	2	(E only CH1,2)
31		VSE0104	AUDIO METER	3	(B only CH1,2,3)
31		VSE0090	AUDIO METER	1	(E-CH3)
32		VSE0106	VIDEO METER	1	(E-CH4)
32		VSE0105	VIDEO METER	1	(B-CH4)
33		VMP1008	EJECT SW HOLDER	1	
36		VGU3394	EJECT BUTTON	1	
37		EST15367S	POWER SW	1	
45		VMP0959	VOLUME HOLDER ANGLE	1	
46		VGU3388	LEVER SW KNOB	1	
55		VGH0520	SLIDE SW SHEET	3	
56		VGU2089	SLIDE SW COVER	3	
57		VSR0057	SEARCH DIAL U	1	
65		VMP1926	P.C.B. HOLDER ANGLE	3	
70		EWGG0AP15A14	HEAD PHONE VOLUME	1	
71		VMP0589	HEAD PHONE HOLDER	1	
72		VGU3121	HEAD PHONE KNOB	1	
74		VMZ0655	SW SHEET	2	
75		VMP1057	RAIL HOLDER ANGLE (L)	1	
76		VGU2080	SW KNOB	3	
77		VMZ1194	SW SHEET	1	
79		VYP2748	CONTROL PLATE	1	
82		VMP0587	PANEL HOLDER ANGLE	1	
89		VMP1056	RAIL HOLDER ANGLE	1	
90		VMZ1160	P.C.B. COVER	1	
91		VEE3224	20P FLAT CABLE	1	
92		VJA0477	40P FLAT CABLE	1	
93		VMB1730	EJECT BOTTON SPRING	1	
94		VMP1006	EARTH ANGLE	1	
95		VGU4112	ROTARY SW KNOB	2	
101		XTN4+10G	SCREW	30	
102		XSS3+6FZS	SCREW	7	
104		XSB3+8S	SCREW	4	
105		XSS3+8FCS	SCREW	4	
106		XTV3+8J	SCREW	15	
107		XTN4+10J	SCREW	9	
108		XSN3+6S	SCREW	6	
109		XYN3+C18S	SCREW	2	
110		XYN3+C5S	SCREW	1	
111		XTV3+10J	SCREW	4	
112		XSN3+8S	SCREW	4	
113		XSB3+5S	SCREW	4	
114		XTB4+20G	SCREW	1	
116		XSS3+8FCS	SCREW	2	
117		VMS2721	SEARCH DIAL BUSH	1	
119		XTS3+8GFC	SCREW	4	
121		XTV4+20G	SCREW	6	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

REAR PANEL ASSEMBLY



REAR PANEL ASSEMBLY

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VJS1087	BNC CONNECTOR	10	
2		VMZ0631	BNC NUT	10	
4		VMZ0630	WASHER	10	
6		VMP0965	FAN MOTOR MOUNT PLATE (R)	1	
8		VJP1894	XLR CONNECTOR	4	
9		VJS1921	12P CONNECTOR	1	
10		VHD0178	CONNECTOR	2	
12		VGF0116	FAN MOTOR COVER	2	
13		VGH1933	REAR JACK PLATE	1	
15		VJS1920	XLR CONNECTOR	1	
16		VMP0994	JACK FLEXIBLE PLATE (R)	1	
19		VHD0325	SCREW	2	
20		VMP0960	JACK FLEXIBLE PLATE (L)	1	
21		VMP0688	50P CONNECTOR COVER	1	
25		VRF0037	FAN MOTOR	2	
26		VMP0999	FAN MOTOR MOUNT PLATE (L)	1	
27		VGU2085	SLIDE SW COVER (A)	1	
29		VJH0082	GND TERMINAL	1	
30		VGF0197	FAN MOTOR COVER	1	
31		VRF0052	FAN MOTOR	1	
32		VMP2193	POWER SUPPLY CASE	1	
34		VSC1737	REG 2B COOLING BODY	1	
35		VSC1736	REG 2A COOLING BODY	1	
36		ESD3989S	VOLTAG ALTERATION SW	1	
37		VMP0948	POWER SOURCE CASE	1	
38		VSC2845	REG 1A COOLING BODY	1	
39		VSC1735	REG 1B COOLING BODY	1	
41		VGH0962	POWER PLATE	1	
42		VHN0059	PRASTIC NUT	12	
43		VMZ0832	SHIELD PLATE	1	
45		VSQ0616	CIRCUIT BRAKER	1	
46		VSQ0530	AC INLET	1	
47		VMZ0833	SHIELD PLATE	1	
50		VMP0955	TRANSISTOR HOLDER 1	1	
51		VMP0953	TRANSISTOR HOLDER 2	1	
52		VMP0954	TRANSISTOR HOLDER 3	1	
53		VMP0952	TRANSISTOR HOLDER 4	1	
54		VMP0951	TRANSISTOR HOLDER 5	1	
55		VJS2387	16P CONNECTOR	1	
56		VJP2524	XLR CONNECTOR (A)	1	
59		VJR3	CLAMPER	1	
60		VMP1518	BNC MOUNT ANGLE	1	
61		VMZ0828	BARRIER	1	
62		VYK2511	POWER BOX U	1	
63		VMZ1378	REG 2 CASE BARRIER	1	
64		VMZ1389	POWER SOURCE CASE BARRIER	1	
65		VMZ1377	REG 1 CASE BARRIER	1	
70		XTV3+6FR	SCREW	8	
72		XTB3+6FFZ	SCREW	12	2
73		XSN4+35FCS	SCREW	8	
74		XSN4+25FCS	SCREW	4	
75		XSB3+6FZS	SCREW	6	
76		XYN3+F8S	SCREW	9	
77		XTV3+6F	SCREW	10	
79		XYN3+F8FZS	SCREW	3	
81		XYN3+C10S	SCREW	2	
82		XSS3+8S	SCREW	16	
83		XTB4+12GFZ	SCREW	12	
84		XTN26+6FFY	SCREW	13	
85		XTN3+6FFY	SCREW	4	
86		XSS3+12S	SCREW	2	
87		XNG4ES	NUT	4	
88		XWA4B	WASHER	4	
89		XWG4	WASHER	4	

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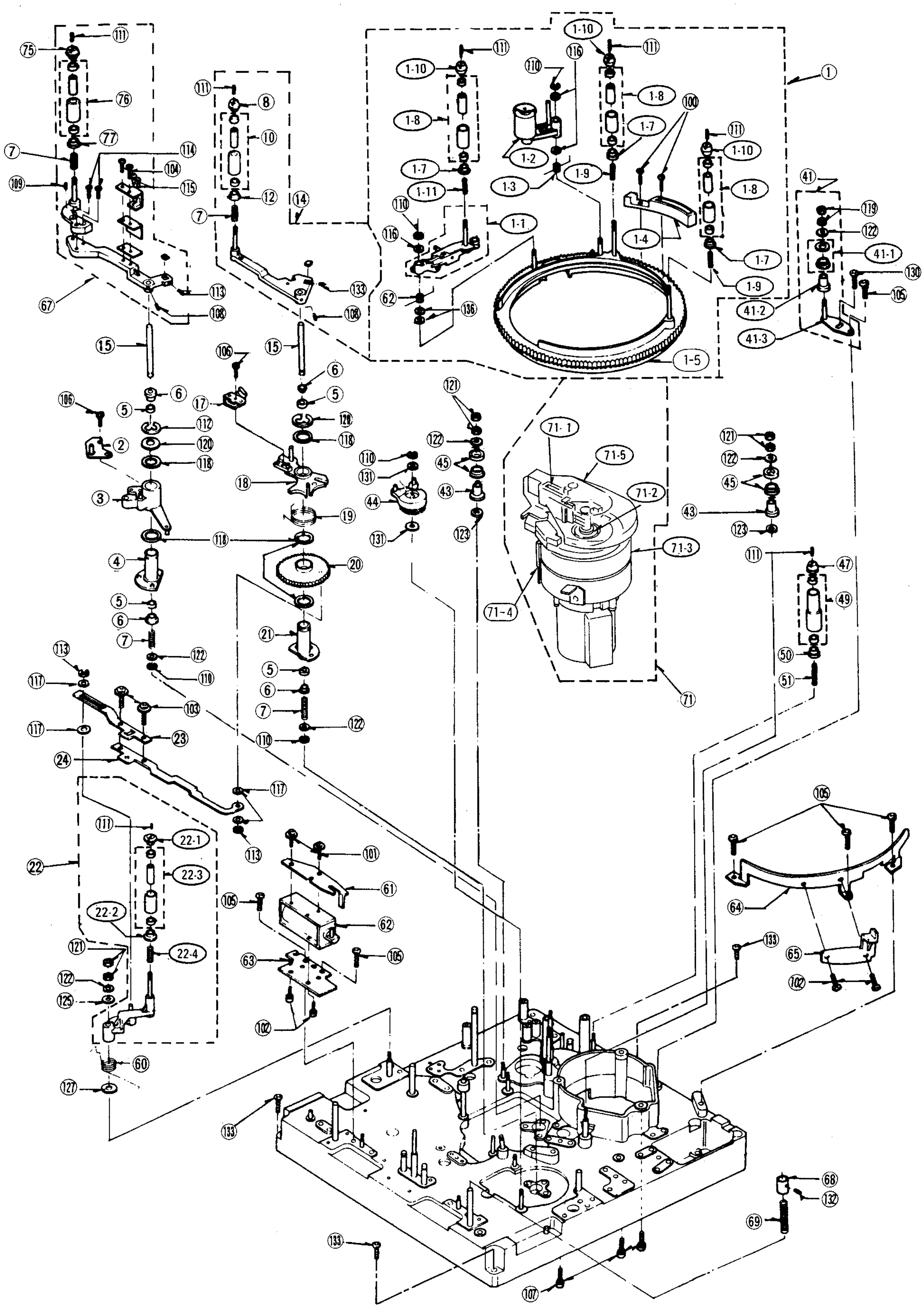
MECHANICAL CHASSIS ASSEMBLY (1)



MECHANICAL CHASSIS ASSEMBLY (1)

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VXP0990	LOADING RING (C) U	1	
1-1		VXL1318	TURN ROLLER ARM U	1	
1-2		VXL1288	PINCH ROLLER ARM U	1	
1-3		VMB1373	PINCH ROLLER RETURN SPRING	1	
1-4		VMA6712	REVERSE ANGLE	1	
1-5		VXP0660	LOADING RING (1) U	1	
1-6		VMB1796	TR SPRING	1	
1-7		VMS2803	LOWER FLANGE	2	
1-8		VXP0821	POST COLLER (B) U	3	
1-9		VMB1377	POST SPRING	2	
1-10		VMS3638	UPPER FLANGE	3	
1-11		VMB1376	POST SPRING	1	
2		VXA2302	STOPPER PIN BASE U	1	
3		VXL1309	S.TA SAB ARM (1) U	1	
4		VDB0772	S.TENSION HOUSING	1	
5		VDB0779	BEARING	4	
6		VMX0794	TENSION ARM HOLDER	4	
7		VMB1378	POST SPRING	4	
8		VMS3639	UPPER FLANGE	1	
10		VXP0820	LIMITER ROLLER(A) U	1	
12		VMS2800	LOWER FLANGE	1	
14		VXL1319	T.TENSION ARM U	1	
15		VMS3662	TENSION PICK-UP POST	1	
17		VXA2306	STOPPER PIN BASE U	1	
18		VXA2305	T.TENSION U BASE	1	
19		VMB1365	T.TENSION U.BASE SPRING	1	
20		VXP0662	T. TENSION CONTROL GEAR	1	
21		VDB0773	T. TENSION HOUSING	1	
22		VXL1323	PULL ARM U	1	
22-1		VMS3639	UPPER FLANGE	1	
22-2		VMS2800	LOWER FLANGE	1	
22-3		VXP0820	POST ROLLER (A) U	1	
22-4		VMB1378	POST SPRING	1	
23		VMM0145	P1 CONTROL ROD (B)	1	
24		VXA2304	P1 CONTROL LOAD(A) U	1	
41		VXR0130	RING ROLLER U	1	
41-1		VDP1010	RING ROLLER	2	
41-2		VMX0797	RING ROLLER COLLAR(B)	1	
41-3		VXA2293	RING ROLLER BASE U	1	
43		VMX0796	RING ROLLER SLEEVE (A)	2	
44		VXP0658	T.TENSION BASE GEAR U	1	
45		VDP1010	RING ROLLER	4	
47		VXA2271	UPPER FLANGE	1	
49		VXP0824	LIMITER ROLLER(B) U	1	
50		VMS2806	POST BEARING HOLDER (A)	2	
51		VMB1379	SPRING	1	
60		VMB1362	P1 PULL ARM SPRING	1	
61		VMA6605	BRAKE LEVER STOPPER	1	
62		VSJ0068	BRAKE SOLENOID	1	
63		VMA6604	BRAKE SOLENOID BASE	1	
64		VMA6652	TURN ROLLER LIFTER	1	
65		VML1780	SIDE STOPPER	1	
67		VXL1320	SUPPLY TENSION ARM U	1	
68		VMX0803	CASSETTE HOLDER	1	
69		VMB1361	CASSETTE HOLDER ADJ SPRING	1	
71		VEG0731	DRUM U	1	
71-1		VXS0091	BRUSH U	1	
71-2		VXS0092	SLIPRING U	1	
71-3		VEH0448	UPPER DRUM	1	
71-4		VEK2372	DEW SENSOR	1	
71-5		VMD0685	BRUSH COVER	1	
75		VMS2797	UPPER FLANGE	1	
76		VXP0820	POST ROLLER (A) U	1	
77		VMS2801	LOWER FLANGE	1	
100		XYN26+C6	SCREW	6	
101		XYN26+F5	SCREW	2	
102		XYN26+C4	SCREW	4	
104		XYNV26+K8	SCREW	2	
105		XTV3+6F	SCREW	6	
106		XYNV26+K5	SCREW	2	
107		XYN3+K10S	SCREW	3	
108		XXE26W3FP	HEX SCREW	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
109		XXE26A4FP	HEX SCREW	1	
110		XUC25FP	E-RING	5	
111		XXE2C25FP	HEX SCREW	7	
112		XUC8FP	E-RING	2	
113		XUC2FP	E-RING	2	
114		XSN2+6	SCREW	2	
115		XSN2+4	SCREW	2	
116		XWGV3Y6G	WASHER	1	
117		XWGV25D6G	WASHER	4	
118		XWGV10D15G	WASHER	3	
119		XNG3EFX	NUT	2	
120		XWGV10Y15G	WASHER	2	
121		XNG3CS	NUT	5	
122		XWG3	WASHER	6	
123		XWGV4Y7G	WASHER	2	
125		XWGV3D9G	WASHER	1	
126		XYN3+C6	SCREW	2	
130		XTV3+6FR	SCREW	1	
131		XWGV3D6G	WASHER	2	
132		XXEV3W3FP	HEX-SCREW	1	
113		XXE2D3FP	HEX-SCREW	1	
103		XYN26+F5S	SCREW	2	
133		XYN4+C20S	SCREW	3	
134		XYN2+C4	SCREW	1	
135		XYNV3+K8S	SCREW	2	
136		XWGV3Y8G	SCREW	1	
137		XYNV0015	SCREW	1	

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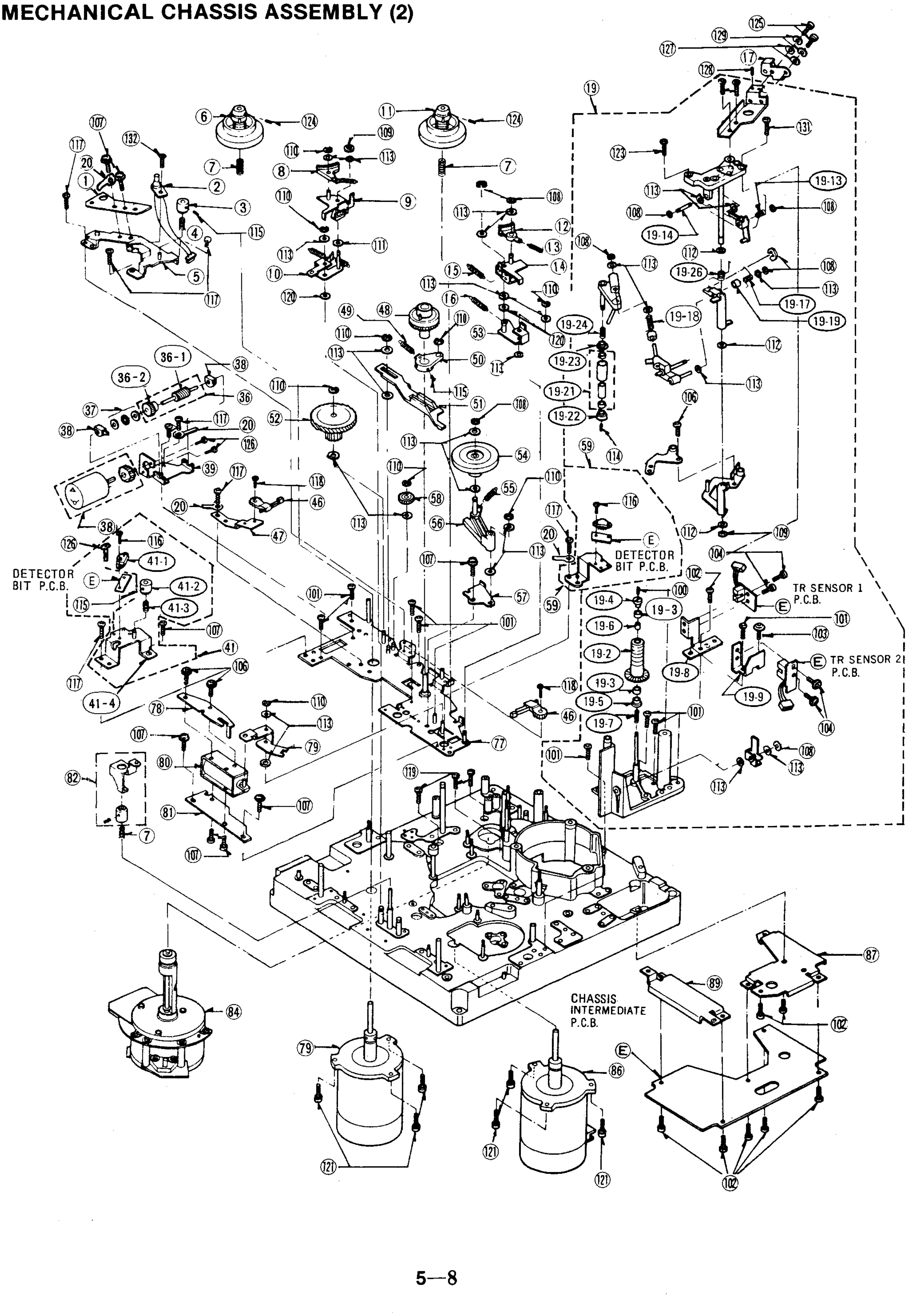
MECHANICAL CHASSIS ASSEMBLY (2)



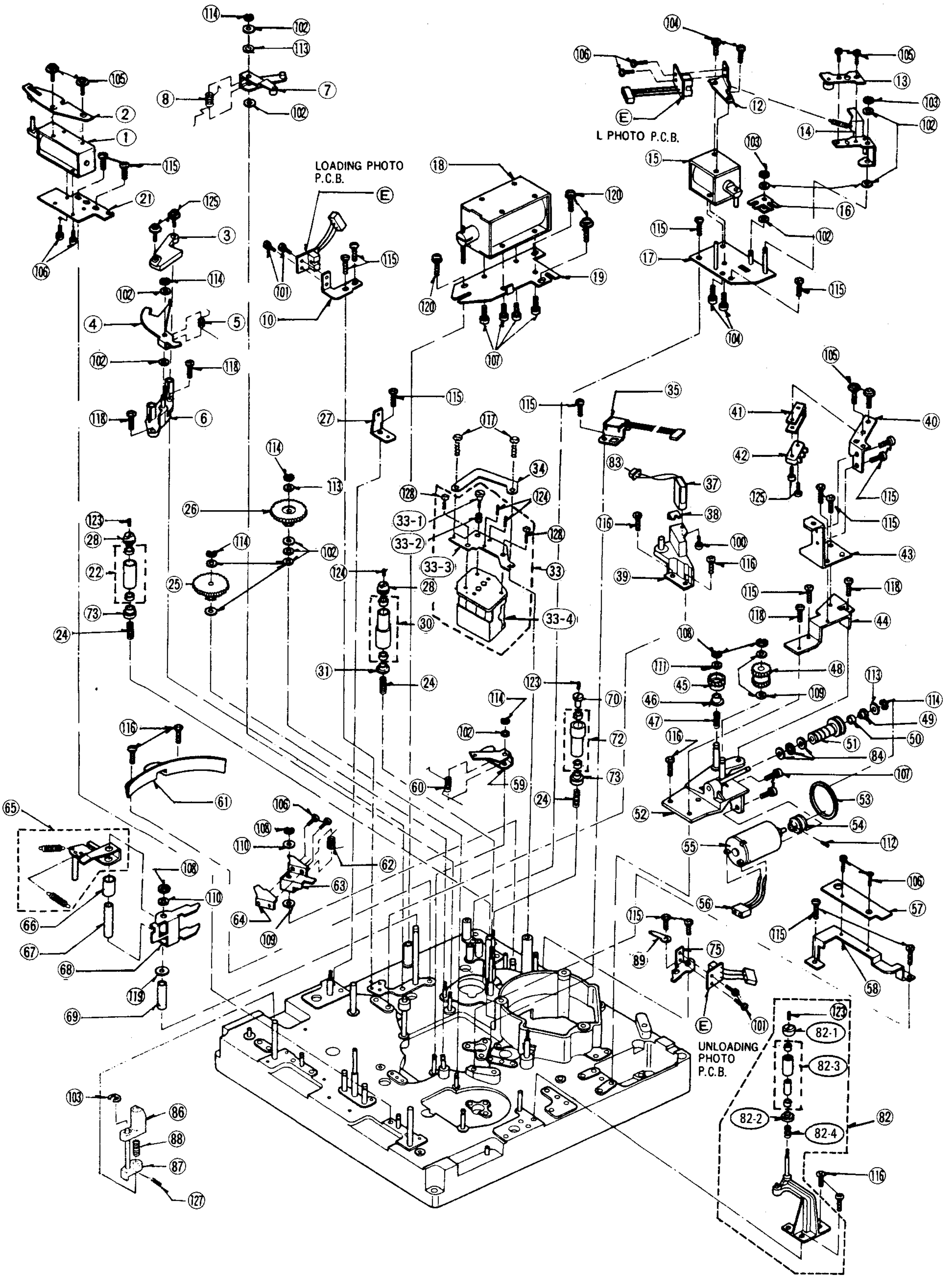
MECHANICAL CHASSIS ASSEMBLY (2)

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VMA6633	PINCH ROLLER GUIDE	1	
2		VEK2398	S TAPE END DET U	1	
3		VMS3126	S CASSETTE SUPPORT	1	
4		VMB1546	S CASSETTE SUPPORT SPRING	1	
			(4)		
5		VXA2663	S TAPE END DET BASE (1) U	1	
6		VXP0876	TAKE-UP REEL U	1	
7		VMB0974	REEL ADJ SPRING	3	
8		VXL1280	BRAKE LEVER (1) U	1	
9		VXL1281	S BRAKE LEVER (2) U	1	
10		VXL1282	S BRAKE LEVER (3) U	1	
11		VXR0164	S REEL U	1	
12		VXL1475	BRAKE LEVER (A) U	1	
13		VMB1340	BRAKE LEVER SPRING	1	
14		VXL1476	BRAKE LEVER (B) U	1	
15		VMB1542	BRAKE SPRING (1)	1	
16		VMB1543	BRAKE SPRING (2)	1	
17		VXA2525	SLOPE ADJ BASE U	1	
19		VXA3419	SUB LOADING U	1	
19-1		VXA2299	SUB LOADING BASE (1) U	1	
19-2		VXP0656	TR ENCODER U	1	
19-3		VDB0778	BEARING	2	
19-4		VHN0046	TIMER ROLLER NUT	1	
19-5		VMS2806	POST BEARING HOLDER (A)	1	
19-6		VMX0801	TIMER ROLLER COLLAR	1	
19-7		VMB1379	POST SPRING (P3)	1	
19-8		VMA6645	TR SENSOR ANGLE (A)	1	
19-9		VMA6646	TR SENSOR ANGLE (B)	1	
19-10		VML1694	CONTROL LEVER	1	
19-13		VMB1374	MOVE LEVER RETURN SPRING	1	
19-14		VMS2829	MOVE LEVER SHAFT	1	
19-17		VMB1375	IP ARM SPRING	1	
19-18		VMB1368	SLOPE SPRING	1	
19-21		VXP0822	POST BEARING (C) U	1	
19-22		VMS3638	UPPER FLANGE	1	
19-23		VMS2870	BEARING HOLDER	1	
19-24		VMB1376	POST SPRING	1	
19-26		VMB1800	IP SPRING	1	
20		VJR3	CLAMPER	4	
36		VXP0763	WORM U	1	
36-1		VXP0760	WORM	1	
36-2		VDG0327	WORM INT GEAR	1	
37		VDB0835	BEARING	1	
38		VDB0833	WORM CAUSKT	2	
39		VMA6869	MOTOR BASE	1	
40		VEM0264	MOTOR U	1	
41		VES0479	DETECTOR BIT BASE L U	1	
41-1		EVQWUS002	CASS DISCRIMINATE MODE	1	
41-2		VMS3126	S CASS SUPPORT	1	
41-3		VMB1545	S CASS SUPPORT SPRING	1	
41-4		VXA2661	DETECTOR BIT BASE (1) U	1	
46		VSH0026	LEAF SW	2	
47		VMA6877	SW BASE	1	
48		VXP0877	S CASSETTE REEL U	1	
49		VMB1540	REEL SPRING	1	
50		VMA6868	REEL BASE	1	
51		VML1837	SLIDE LEVER	1	
52		VDG0329	CONTROL GEAR	1	
53		VXL1477	BRAKE LEVER (C) U	1	
54		VXP0757	INTERMEDIATE GEAR	1	
55		VMB1541	GEAR SPRING	1	
56		VXL1474	INTERMEDIATE GEAR LEVER	1	
57		VMA7151	GEAR ADJ BASE	1	
58		VDG0330	INTERMEDIATE GEAR	1	
59		VES0347	DETECTOR BIT BASE R U	1	
77		VXA3580	GEAR BASE U	1	
78		VMA6605	BRAKE LEVER STOPPER	1	
79		VML1841	BRAKE CONTROL LEVER	1	
80		VSJ0091	BRAKE SOLENOID	1	
81		VMA6604	BRAKE SOLENOID BASE	1	
82		VXA2664	CASSETTE ADJ BASE	1	
84		VEM0227	CAPSTAN U	1	
85		VRD0031	S REEL MOTOR	1	
86		VRD0032	T REEL MOTOR	1	
87		VMP0672	LOADING MOTOR INT. P.C.B.	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
			HOLDER		
89		VMA6946	INTERMEDIATE P.C.B.HOLDER	1	
90		VXR0131	IP BASE U	1	
100		XXE2D3FP	HEX-SCREW	1	
101		XTV3+8F	SCREW	8	
102		XTV3+6F	SCREW	8	
103		XYN3+F6S	SCREW	1	
104		XYN26+K5	SCREW	4	
106		XYN26+F5	SCREW	3	
107		XYN26+C4	SCREW	6	
108		XUC25FP	E-RING	9	
109		XUC3FP	E-RING	3	
110		XUC2FP	E-RING	8	
111		XWGV3D9G	WASHER	1	
112		XWGV4D7G	WASHER	3	
113		XWGV3D6G	WASHER	24	
114		XXE2C25FP	HEX-SCREW	1	
115		XXE26W3FP	HEX-SCREW	3	
116		XQN16+A3	SCERW	2	
117		XYN3+C4S	SCERW	8	
118		XYN2+C6	SCERW	2	
119		XYN3+C12S	SCERW	3	
120		XWGV4F9G	WASHER	2	
121		XTV3+10F	SCREW	6	
123		XTV3+12F	SCREW	1	
124		XXEV3W4FPS	HEX-SCREW	2	
125		XYN2+C4	SCREW	2	
126		XSN2+3	SCREW	2	
127		XWE3	WASHER	2	
128		XXE3A6FPS	HEX-SCREW	1	
129		XWA3B	WASHER	2	
130		XVE3B6FPS	SCREW	2	
131		XYNV3+K12S	SCREW	1	
132		XSS26+5	SCREW	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

MECHANICAL CHASSIS ASSEMBLY (3)



MECHANICAL CHASSIS ASSEMBLY (3)

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VSJ0091	BRAKE SOLENOID	1	
2		VMA6605	BRAKE LEVER STOPPER	1	
3		VMA7289	STOPPER UPPER HOLDER	1	
4		VML1702	STOPPER LEVER	1	
5		VMB1372	STOPPER SPRING	1	
6		VXA2291	TURN ROLLER STOPPER U	1	
7		VXL1287	DRIVE ARM U	1	
8		VMB1363	DRIVE ARM SPRING	1	
10		VMA6624	LOADING PHOTO PLATE	1	
18		VSJ0069	PINCH SOLENOID	1	
19		VMA6608	PINCH SOLENOID BASE	1	
21		VMA6871	BRAKE SOLENOID BASE	1	
22		VXP0824	LIMITER ROLLER(B) U	1	
24		VMB1379	POST SPRING	3	
25		VDG0219	SUB LOADING GEAR (1)	1	
26		VDG0220	SUB LOADING GEAR (2)	1	
27		VMA6625	PINCH SPRING HOOK	1	
28		VXA2271	UPPER FLANGE	2	
30		VXP0823	LIMITER ROLLER (A) U	1	
31		VMS2806	POST BEARING HOLDER (A)	1	
33		VED0066	A/C HEAD ASSEMBLY U	1	
33-1		VHD0183	ADJUST SCREW	1	
33-2		VMB1344	ADJUST SPRING	1	
33-3		VMA7280	HEAD BASE PLATE	1	
33-4		VBR0134	A/C HEAD U	1	
34		VMA7280	A/C HEAD INSTALL PLATE	1	
35		VEK3784	MAGNETIC SENSOR U	1	
37		VBS0043	FE HEAD	1	
38		VMX0868	SPACER	1	
39		VMA7293	FE HEAD BASE U	1	
40		VMA6802	MICRO SW PLATE	1	
41		VMA6804	MICRO SW ADJUST PLATE	1	
42		VSM0042	MICRO SW	1	
43		VMA6803	SL PLATE	1	
44		VMA6805	MOTOR HOLDER COVER	1	
45		VDG0215	RING GEAR	1	
46		VMX0793	ARM SLEEVE	1	
47		VMB1343	SPRING	1	
48		VDG0216	GEAR	1	
49		VMX0794	BEARING HOLDER	1	
50		VDB0779	BEARING	1	
51		VXP0657	WORM PULLY U	1	
52		VXA2287	LOADING MOTOR HOLDER	1	
53		VDV0156	LOADING BELT	1	
54		VDP1008	LOADING MOTOR PULLY	1	
55		VRD0030	LOADING MOTOR	1	
56		VEE1795	CONNECTOR	1	
57		VMA6633	PINCH ROLLER GUIDE	1	
58		VMA6634	PINCH ROLLER GUIDE BASE	1	
59		VML1679	HOLDER LEVER	1	
60		VMB1364	HOLDER LEVER SPRING	1	
61		VMD1412	TURN ROLLER GUIDE	1	
62		VMB1345	SPRING	1	
63		VML1680	UNLOADING ARM	1	
64		VMA6685	TURN ROLLER HOLDER PLATE	1	
65		VXL1286	PINCH ARM	1	
66		VMX0800	PINCH COLLAR	1	
67		VMX0799	PINCH COLLAR	1	
68		VML1675	PINCH PRESS LEVER	1	
69		VMX0798	PINCH COLLAR	1	
70		VMS3712	POST BEARING HOLDER (B)	1	
72		VXP0819	LIMITER ROLLER (A) U	1	
73		VXA2272	LOWER FLANGE	1	
75		VMA6623	UNLOADING PHOTO BASE	1	
82		VXA3226	CASSETTE POS. FIX BASE U	1	
82-1		VMS2796	UPPER FLANGE	1	
82-2		VMS2803	LOWER FLANGE	1	
82-3		VXP0821	POST COLLAR	1	
82-4		VMB1376	POST SPRING	1	
83		VEE1806	CONNECTOR	1	
84		VDB0371	BEARING	3	
86		VMD0977	CASSETTE GUIDE S	1	
87		VXA2836	CASSETTE GUIDE BASE S	1	
88		VMB1633	CASSETTE GUIDE S SPRING	1	
89		VJR3	CLAMPER	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
90		VXL1285	PINCH PRESS LEVER U	1	
100		XYN2+C5	SCREW	1	
101		XYNV26+K5	SCREW	4	
102		XWGV3D6G	WASHER	10	
103		XUC2FP	E-RING	1	
104		XYNV3+K5S	SCREW	3	
105		XYN26+F5	SCREW	4	
106		XYN26+C4	SCREW	6	
107		XYN3+C5S	SCREW	6	
108		XUC3FP	E-RING	4	
109		XWGV4D7G	WASHER	3	
110		XWGV4D9G	WASHER	2	
111		XWE4	WASHER	1	
112		XXE2W3FP	HEX-SCREW	1	
113		XWGV3Y6G	WASHER	3	
114		XUC25FP	E-RING	6	
115		XTV3+6F	SCREW	15	
116		XTV3+8F	SCREW	7	
117		XYNV3+K10S	SCREW	4	
118		XTV3+10F	SCREW	4	
119		XWGV5D9G	WASHER	1	
120		XYN3+F8S	SCREW	2	
123		XXE2C25FP	SCREW	3	
124		XXC2C25FP	HEX-SCREW	3	
125		XYN26+C6	SCREW	2	
127		XXEV26W3FP	HEX-SCREW	1	
128		XSN26+6S	HEX-SCREW	2	

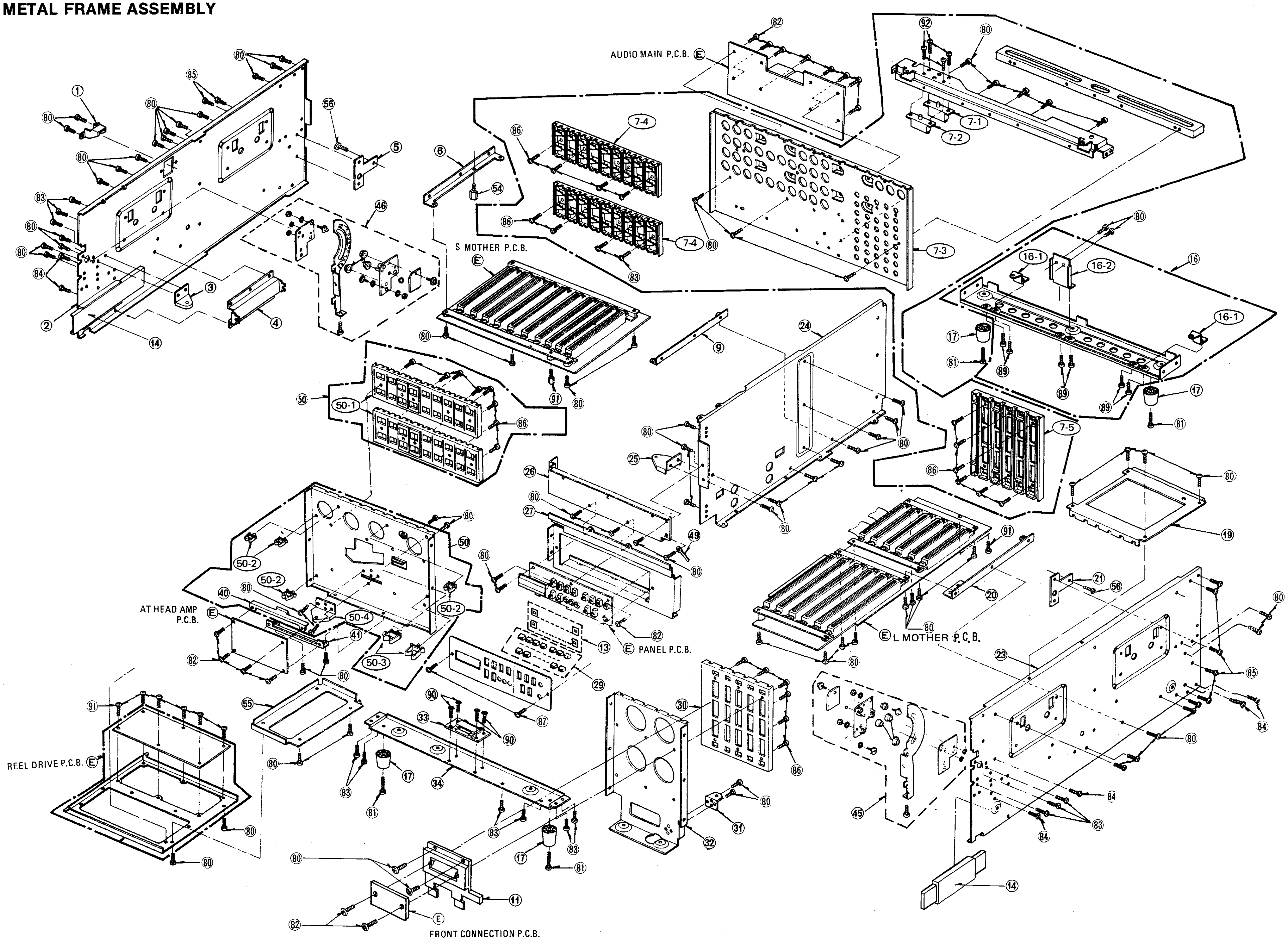
To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

METAL FRAME ASSEMBLY

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VMP0842	TOP MOUNT PLATE	1	
2		VMP0609	SIDE FRAME (L)	1	
3		VMP0616	CHASSIS FRAME (L)	1	
4		VMP0608	POWER SUPP MOUNT PLATE	1	
5		VMP0997	POWER SUPP MOUNT PLATE (L)	1	
6		VMP0602	P.C.B MOUNT PALTE (B)	1	
7		VXA3219	GUIDE FRAME (L) U.	1	
7-1		VSQ0429	CIRCUIT BRAKER (2A)	1	
7-2		VSQ0428	CIRCUIT BRAKER (10A)	1	
7-3		VMP1095	GUIDE FRAME (L)	1	
7-4		VGQ1123	P.C.B GUIDE (S)	2	
7-5		VGQ1076	GUIDE RAIL (L)	1	
9		VMP0603	P.C.B. MOUNT PLATE (C)	1	
11		VMP1157	FRONT CONNECTION P.C.B.	1	
			PLATE		
13		VGH0520	SWITCH COVER	19	
14		VYQ0013	RACK MOUNT GUIDE	1	
16		VXA2624	GUIDE FRAME (L2) U.	1	
16-1		VMP0679	P.C.B. MOUNT PLATE (E)	2	
16-2		VMP0692	GUIDE FRAME (L2)	1	
17		VKA0027	FOOT	4	
19		VMP0957	TOP MOUNT	1	
20		VMP0601	P.C.B. MOUNT PLATE (A)	1	
21		VMP0996	POWER SUPP MOUNT PLATE (R)	1	
23		VMP0610	SIDE FRAME (R)	1	
24		VMP1577	CENTER FRAME	1	
25		VMP0617	CHASSIS FRAME (R)	1	
26		VMP0958	FRONT FRAME	1	
27		VMP1526	SUB FRONT FRAME	1	
29		VGU2089	SLIDE SW COVER	19	
30		VGQ1076	GUIDE RAIL (L)	1	
31		VMP0678	P.C.B. MOUNT PLATE (D)	1	
32		VMP1096	GUIDE FRAME (S)	1	
34		VXA2623	FOOT MOUNT PLATE	1	
34-1		VGQ1050	PULL GUIDE	1	
36		VMP1139	P.C.B HOLDER ANGLE	1	
40		VMP0565	P.C.B. MOUNT PLATE (U)	1	
41		VMP0566	P.C.B. MOUNT PLATE (D)	1	
45		VYQ0172	FLEXIBLE PLATE U. (R)	1	
46		VYQ0173	FLEXIBLE PLATE U. (L)	1	
49		VJR3	CLAMPER	1	
50		VXA2628	GUIDE FRAME U.	1	
50-1		VGQ1123	P.C.B. GUIDE	2	
50-2		VJF0004	M. CLAMPER (S)	2	
50-3		VJF0022	M. CLUMPER (L)	4	
50-4		VMP0618	CHASSIS FRAME (C)	1	
54		VMS2735	BOTTOM COVER MOUNT BOSS	1	
55		VMP1087	TC. P.C.B. MOUNT ANGLE	1	
56		VHD0277	SCREW	2	
80		XTV3+6F	SCREW	82	
81		XYN4+C14S	SCREW	4	
82		XTV3+6FR	SCREW	13	
83		XSB3+6S	SCREW	14	
90		XSS3+5S	SCREW	4	
85		XYN3+C6	SCREW	7	
86		XTV3+8F	SCREW	26	
87		XTB3+6FFZ	SCREW	2	
84		XSB3+5S	SCREW	6	
89		XTB3+6S	SCREW	6	
91		XYE3+EF8	SCREW	7	
92		XYN3+C6S	SCREW	4	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

METAL FRAME ASSEMBLY



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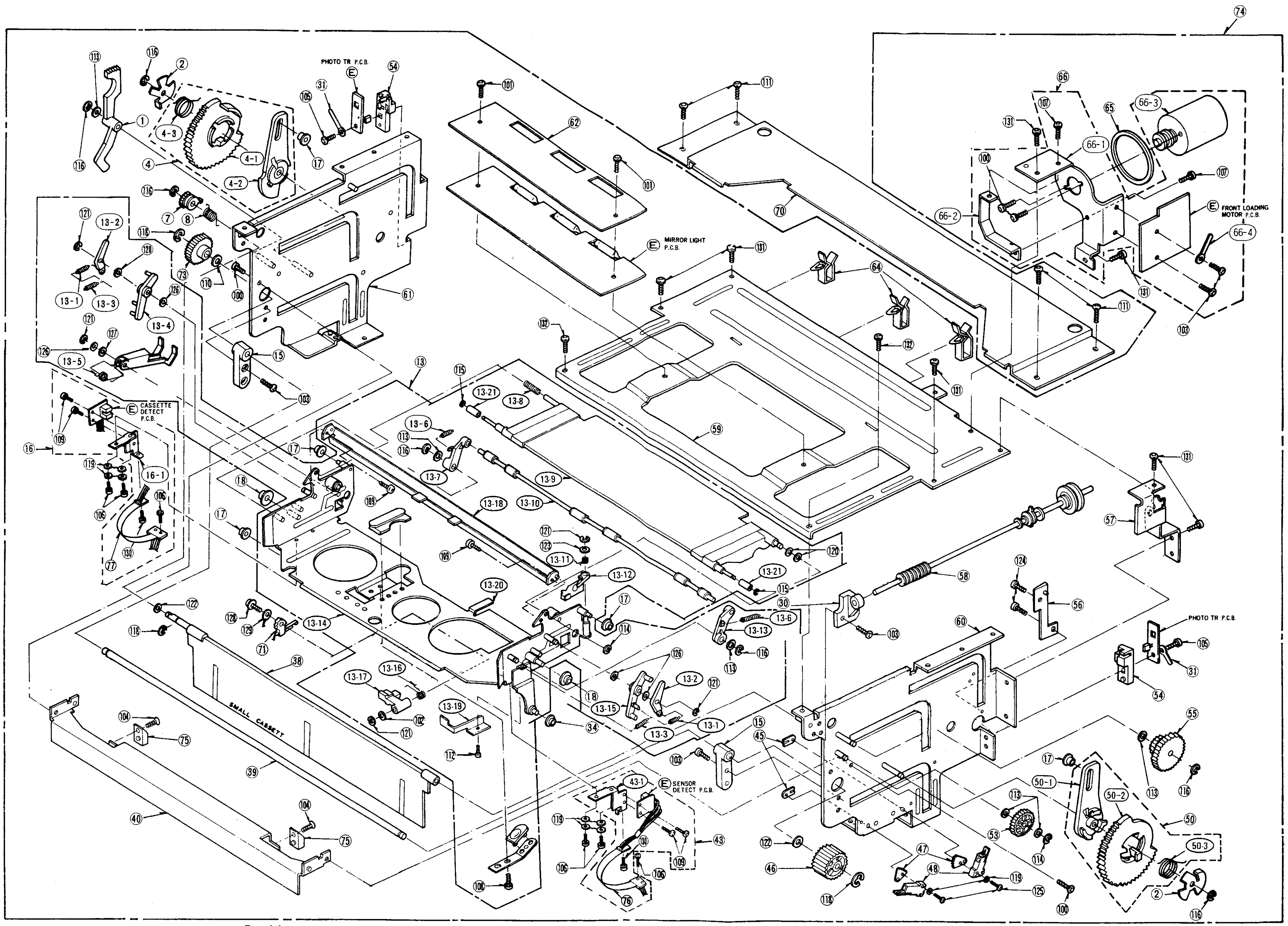
CASSETTE COMPARTMENT ASSEMBLY



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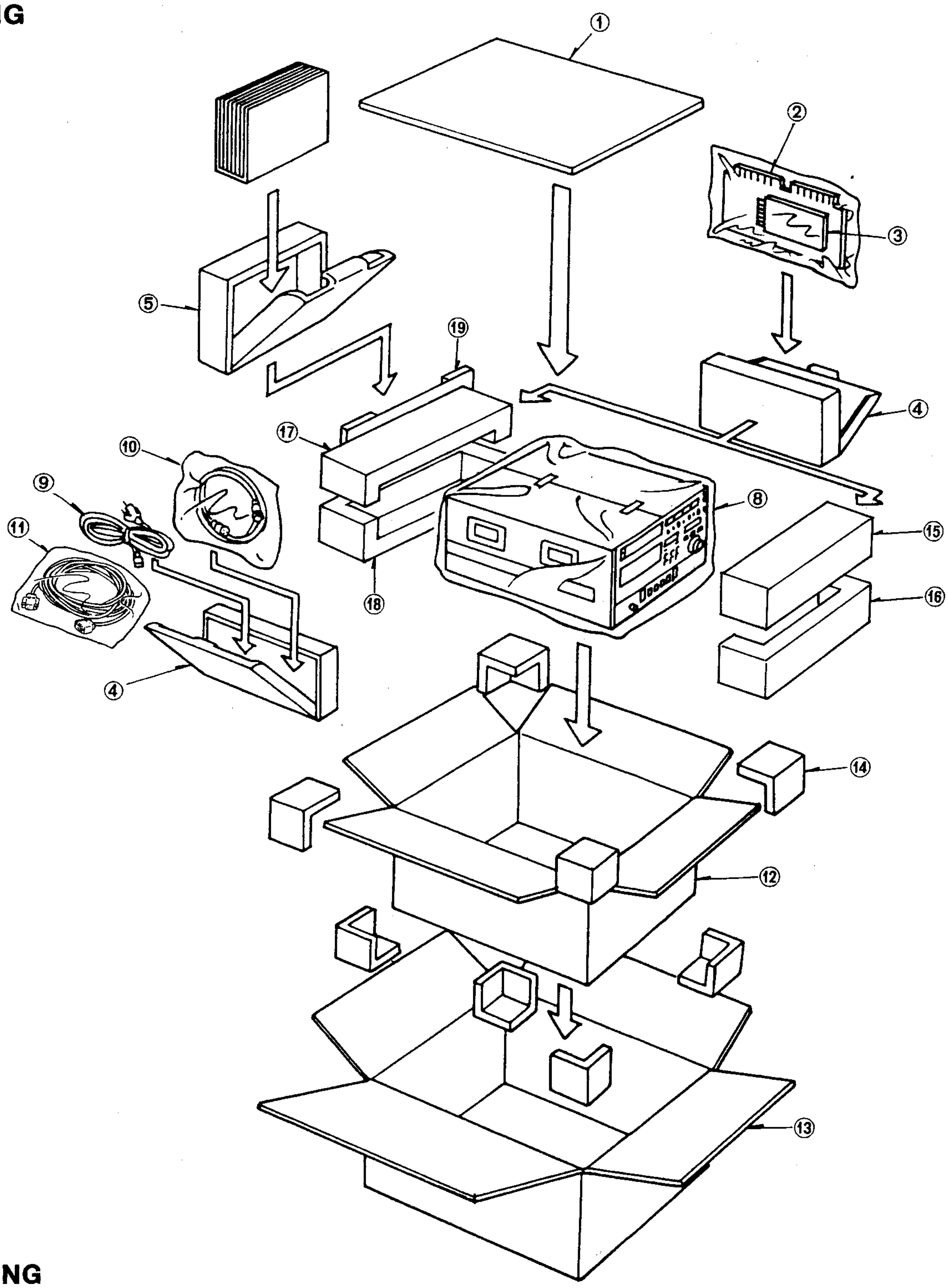
CASSETTE COMPARTMENT ASSEMBLY

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VML1685	PANEL OPENER	1	
2		VMD0748	WIPER SPRING HOLDER	2	
4		VXL1316	WIPER(L)	1	
4-1		VDG0230	WIPER GEAR(L)	1	
4-2		VML1684	WIPER ARM(L)	1	
4-3		VMB1385	WIPER SPRING	1	
7		VDG0231	PANEL GEAR	1	
8		VMB1386	BLINDER PANEL SPRING	1	
13		VXA2990	CASSETTE HOLDER (2) U	2	
13-1		VMB1380	KICK CONTROL LEVER SPRING	2	
13-2		VML1681	KICK LEVER	2	
13-3		VMB1381	KICK LEVER SPRING	2	
13-4		VXL1313	KICK LEVER(L) U	1	
13-5		VMB1547	CASSETTE SPRING	1	
13-6		VMB1382	PRESS LEVER SPRING	2	
13-7		VML1687	PRESS LEVER(L)	1	
13-8		VMB1399	MIRROR SPRING	1	
13-9		VXA2322	MIRROR U	1	
13-10		VXJ0038	PRESS ROLLER SHAFT U	1	
13-11		VMB1383	RELEASE LEVER SPRING	1	
13-12		VXL1278	RELEASE LEVER U	1	
13-13		VML1686	PRESS LEVER(R)	1	
13-14		VXA2993	CASSETTE HOLDER(1) U	1	
13-15		VXL1311	KICK LEVER(R) U	1	
13-16		VMB1548	CASSETTE DETECT SPRING	1	
13-17		VML1845	CASSETTE DETECT LEVER	1	
13-18		VMA7000	ROLLER STOPPER	1	
13-19		VMA7172	ANGLE	1	
13-20		VMD1109	CASSETTE GUIDE (R)	1	
13-21		VDP1023	MIRROR ROLLER	2	
15		VMD0746	MAIN SHAFT BEARING	2	
16		VES0352	CASSETTE DET. SW (L) U	1	
16-1		VMA6880	SENSOR ANGLE (L)	1	
17		VDP1020	GUIDE ROLLER(A)	5	
18		VDP1021	GUIDE ROLLER(B)	2	
30		VMD0747	SHAFT BEARING	1	
31		VJR3	CLAMPER		
34		VDP1022	GUIDE ROLLER(C)	1	
38		VYF0589	BLINDER PANEL U	1	
39		VMS2821	MAIN SHAFT	1	
40		VMA6639	FRONT GUIDE ANGLE	1	
43		VES0351	CASSETTE DET. SW (R) U	1	
43-1		VMA6879	SENSOR ANGLE (R)	1	
45		VMA6664	SW MOUNT PLATE	2	
46		VDG0224	MAIN SHAFT GEAR(R)	1	
47		VMA6663	SW ADJ PLATE	2	
48		VSM0048	SWITCH	2	
50		VXL1315	WIPER(R) U	1	
50-1		VML1683	WIPER ARM	1	
50-2		VDG0229	WIPER GEAR	1	
50-3		VMB1384	WIPER SPRING(R)	1	
53		VDG0226	RELAY GEAR	1	
54		VMD0091	PHOTO TR HOLDER	2	
55		VDG0228	WORM GEAR	1	
56		VMA6637	RELEASE LEVER HOLDER	1	
57		VMA6662	WORM SHAFT MOUNT PLATE	1	
58		VXJ0040	WORM SHAFT(1) U	1	
59		VMA6643	TOP PLATE	1	
60		VXA2317	RIGHT SIDE PLATE(1) U	1	
61		VXA2319	LEFT SIDE PLATE(1) U	1	
62		VMZ0729	MIRROR LIGHT P.C.B COVER	1	
64		VGQ0107	MINI- CLAMP	3	
65		VDV0157	FRONT LOADING BELT	1	
66		VEM0265	FRONT LOADING MOTOR U	1	
66-1		VMA6649	LOADING MOTOR MOUNT PLATE	1	
66-2		VMA6794	BELT COVER	1	
66-3		VEM0228	MOTOR U	1	
66-5		VJR3	CLAMPER	1	
70		VMA6661	CARRIAGE MOUNT PLATE	1	
71		VSH0034	LEAF SW	1	
73		VDG0225	MAIN SHAFT GEAR (L)	1	
74		VXA2989	FRONT LOADING U	1	
75		VMD1048	SPACER	2	
76		VJB80098	FLAT CABLE (R)	1	
77		VJB80099	FLAT CABLE (L)	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
100		XYN3+C4S	SCREW	4	
101		XST3+4RS	SCREW	2	
103		XTV3+6F	SCREW	4	
105		XTV3+8F	SCREW	2	
106		XYN2+C4	SCREW	6	
107		XTV26+5F	SCREW	2	
108		XYN26+F4FZ	SCREW	1	
109		XYN26+C4	SCREW	6	
110		XWGV5Y9G	WASHER	1	
111		XYN3+6S	SCREW	4	
113		XWGV4D7G	WASHER	7	
114		XUC25FP	E-RING	2	
115		XUC15FP	E-RING	2	
116		XUC3FP	E-RING	7	
118		XUC4FP	E-RING	3	
119		XWG2	WASHER	10	
120		XWGV3D6G	WASHER	3	
121		XUC2FP	E-RING	5	
123		XWE26	WASHER	1	
124		XSN2+3	SCREW	2	
125		XSN2+10	SCREW	2	
126		XWGV3Y6G	WASHER	4	
127		XWGV3Z6G	WASHER	1	
128		XYN2+C6	SCREW	1	
129		VJR0111	TERMINAL WASHER	1	
112		XYN2+C3	SCREW	1	
122		XWGV5D9G	WASHER	2	
102		XWGV3D5G	WASHER	1	
104		XTS3+6FFZ	SCREW	2	
130		XTN3+4F	SCREW	2	
131		XYN3+6F	SCREW	7	
132		XTN3+4F	SCREW	2	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

PACKAGING



PACKAGING

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1		VPN1902	TOP PAD	1	
2		VFK0434	EXTENSION BOARD (L)	1	
3		VFK0298	EXTENSION BOARD (S)	1	
4		VPG2857	EXTENSION CASE	2	
5		VPG2858	S/M CASE	1	
8		VPF0296	COVER	1	
9		VJA0173	POWER CODE (E)	1	
9		VJA0172	POWER CODE (B only)	1	
10		VJA0402	COMPONENT CABLE	1	
11		VJA0442	SERIAL CABLE	1	
12		VPG3477	PACKING CASE (IN)	1	
13		VPG4552	PACKING CASE (OUT)	1	
14		VPN1900	CORNER PAD	8	
15		VPN1903	UPPER FRONT CUSHION	1	
16		VPN1904	LOWER FRONT CUSHION	1	
17		VPN1905	UPPER REAR CUSHION	1	
18		VPN1906	LOWER REAR CUSHION	1	
19		VPN1901	CUSHION	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

ELECTRICAL REPLACEMENT PART LIST

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
L0		VEP81038A	P.C.BOARD W/COMPONENT	1	
			L MOTHER		
L1		VEP88039A	P.C.BOARD W/COMPONENT	1	
			TBC1 & SYNC GEN		
		VEP88046B	P.C.BOARD W/COMPONENT	1	PART OF VEP88039A
			TBC1 SUB1		
L2		VEP88020B	P.C.BOARD W/COMPONENT	1	
			TBC2		
		VEP80467A	P.C.BOARD W/COMPONENT	1	PART OF VEP88020B
			TBC2 SUB1		
L3		VEP88040A	P.C.BOARD W/COMPONENT	1	
			ENCODER		
		VEP88041A	P.C.BOARD W/COMPONENT	1	PART OF VEP88040A
			VISC SUB		
		VEP80211A	P.C.BOARD W/COMPONENT	1	PART OF VEP88040A
			ENCODER SUB		
		VEP80212A	P.C.BOARD W/COMPONENT	1	PART OF VEP88040A
			SEARCH SUB		
		VEP80424A	P.C.BOARD W/COMPONENT	1	PART OF VEP88040A
			LPF SELECT SW		
L5		VEP82046G	P.C.BOARD W/COMPONENT	1	
			SERVO & REEL		
L6		VEP86047K	P.C.BOARD W/COMPONENT	1	
			SYSCON & TC		
S0		VEP86078A	P.C.BOARD W/COMPONENT	1	
			S MOTHER		
S3		VEP88037A	P.C.BOARD W/COMPONENT	1	
			C PB		
		VEP80452A	P.C.BOARD W/COMPONENT	1	PART OF VEP88037A
			C PB SUB1		
S4		VEP83063B	P.C.BOARD W/COMPONENT	1	
			Y PB		
		VEP80442A	P.C.BOARD W/COMPONENT	1	PART OF VEP83063B
			Y PB SUB1		
		VEP80451A	P.C.BOARD W/COMPONENT	1	PART OF VEP83063B
			Y PB SUB2		
		VEP80453A	P.C.BOARD W/COMPONENT	1	PART OF VEP83063B
			Y PB SUB3		
		VEP80491A	P.C.BOARD W/COMPONENT	1	PART OF VEP83063B
			Y PB SUB4		
		VEP80501A	P.C.BOARD W/COMPONENT	1	PART OF VEP83063B
			AUTO EQ SUB		
S5		VEP84071A	P.C.BOARD W/COMPONENT	1	
			PB AMP & FM AUDIO		
		VEP80443A	P.C.BOARD W/COMPONENT	1	PART OF VEP84071A
			FM AUDIO SUB		
S6		VEP84070A	P.C.BOARD W/COMPONENT	1	
			AUDIO 1		
S9		VEP82034D	P.C.BOARD W/COMPONENT	1	
			AT		
		VEP82041B	P.C.BOARD W/COMPONENT	1	
			AT SUB		
S10		VEP81027B	P.C.BOARD W/COMPONENT	1	
			POWER & DRIVE		
		VEP85007B	P.C.BOARD W/COMPONENT	1	
			AT HEAD AMP		
		VEP80363B	P.C.BOARD W/COMPONENT	1	
			BACK PANEL		
		VEP80151A	P.C.BOARD W/COMPONENT	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
			FRONT PANEL CONNECTION		
		VEP80355C	P.C.BOARD W/COMPONENT	1	FOR AU-630-B
			PEAK METER		
		VEP80355B	P.C.BOARD W/COMPONENT	1	FOR AU-630-E
			PEAK METER		
		VEP82035A	P.C.BOARD W/COMPONENT	1	
			REEL DRIVE		
		VEP80368A	P.C.BOARD W/COMPONENT	1	
			HOUR METER		
		VEP00E13D	P.C.BOARD W/COMPONENT	1	
			REMOTE1		
		VEP80419A	P.C.BOARD W/COMPONENT	1	
			REMOTE MAIN		
		VEP80297A	P.C.BOARD W/COMPONENT	1	
			VIDEO OUT		
		VEP83067A	P.C.BOARD W/COMPONENT	1	
			SMPTE OUT		
		VEP84052F	P.C.BOARD W/COMPONENT	1	
			AUDIO MAIN		
		VEP80507A	P.C.BOARD W/COMPONENT	1	<!>
			FILTER		
		VEP81036A	P.C.BOARD W/COMPONENT	1	<!>
			SWITCHING POWER 1		
		VEP80067A	P.C.BOARD W/COMPONENT	1	PART OF VEP81036A
			SUB 2 (P2)		
		VEP81037A	P.C.BOARD W/COMPONENT	1	<!>
			SWITCHING POWER 2		
		VEP80068A	P.C.BOARD W/COMPONENT	1	PART OF VEP81037A
			SUB 1 (P1)		
		VEP80069A	P.C.BOARD W/COMPONENT	1	PART OF VEP81037A
			SUB 2 (P2)		
		VEP80081E	P.C.BOARD W/COMPONENT	1	
			AUDIO VR		
		VEP80083A	P.C.BOARD W/COMPONENT	1	
			METER SELECT		
		VEP80420A	P.C.BOARD W/COMPONENT	1	
			PCM LED		
		VEP80422A	P.C.BOARD W/COMPONENT	1	
			AUTO OFF LED		
		VEP80232A	P.C.BOARD W/COMPONENT	1	
			EJECT SW		
		VEP80333A	P.C.BOARD W/COMPONENT	1	
			METER LAMP		
		VEP86075B	P.C.BOARD W/COMPONENT	1	
			FRONT A		
		VEP86076B	P.C.BOARD W/COMPONENT	1	
			FRONT B		
		VEP80108A	P.C.BOARD W/COMPONENT	1	
			HEAD PHONE		
		VEP80311D	P.C.BOARD W/COMPONENT	1	
			CONTROL SW		
		VEP80410B	P.C.BOARD W/COMPONENT	1	
			CONTROL VR		

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
		VEP80316A	P.C.BOARD W/COMPONENT	1	
			CHASSIS CONNECTION		
		VEP80468A	P.C.BOARD W/COMPONENT	1	
			REF IN		
		VEP80440A	P.C.BOARD W/COMPONENT	1	
			FRONT LOADING		
		VEP00E30A	P.C.BOARD W/COMPONENT	1	
			CASSETTE DETECT SWITCH		
		VEP00E72A	P.C.BOARD W/COMPONENT	1	
			MIRROR LAMP		
		VEP00E04A	P.C.BOARD W/COMPONENT	1	
			LOADING PHOTO		
		VEP00E25A	P.C.BOARD W/COMPONENT	1	
			UNLOADING PHOTO		
		VEP00E27A	P.C.BOARD W/COMPONENT	1	
			TR SENSOR (1)		
		VEP00E28A	P.C.BOARD W/COMPONENT	1	
			TR SENSOR (2)		

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP81038A L MOTHER

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP81038A	P.C.BOARD W/COMPONENT		
L0			MOTHER		
			CAPACITORS		
C1		ECEA1AU221	E.CAPACITOR 10V 220U	1	
CN11,12		VJP1229T	CONNECTOR(MALE) 2P	2	
L1L		VJS2338A080	CONNECTOR (FEMALE)	1	
L2L		VJS2338A080	CONNECTOR (FEMALE)	1	
L3L		VJS2338A080	CONNECTOR (FEMALE)	1	
L5L		VJS2338A080	CONNECTOR (FEMALE)	1	
L6L		VJS2338A080	CONNECTOR (FEMALE)	1	
L1U		VJS2338A100	CONNECTOR (FEMALE)	1	
L2U		VJS2338A100	CONNECTOR (FEMALE)	1	
L3U		VJS2338A100	CONNECTOR (FEMALE)	1	
L5U		VJS2338A100	CONNECTOR (FEMALE)	1	
L6U		VJS2338A100	CONNECTOR (FEMALE)	1	
P2		VJP1153	CONNECTOR(MALE)	1	
P3		VJP1160	CONNECTOR(MALE)	1	
P4		VJP1281	CONNECTOR(MALE)	1	
P5,P6		VJP1152	CONNECTOR(MALE)	2	
P7		VJP1147	CONNECTOR(MALE)	1	
P10		VJP1143	CONNECTOR(MALE)	1	
P11		VJP1149	CONNECTOR(MALE)	1	
P12		VJP1153	CONNECTOR(MALE)	1	
P13		VJP1145	CONNECTOR(MALE)	1	
P14		VJP1147	CONNECTOR(MALE)	1	
P16,17		VJP1107	CONNECTOR(MALE)	2	
P18,19		VJP1188	CONNECTOR(MALE)	2	
P22		VJP1142	CONNECTOR(MALE)	1	
P23		VJP1107	CONNECTOR(MALE)	1	
P24		VJP1152	CONNECTOR(MALE)	1	
P25		VJP1144	CONNECTOR(MALE)	1	
P26		VJP1147	CONNECTOR(MALE)	1	
P27,28		VJP1142	CONNECTOR(MALE)	2	
P30		VJP1142	CONNECTOR(MALE)	1	
P31-33		VJP1146	CONNECTOR(MALE) 10P	3	
P34		VJP1188	CONNECTOR(MALE)	1	
P35,36		VJP1146	CONNECTOR(MALE) 10P	2	
P37		VJP1144	CONNECTOR(MALE)	1	
P40		VJP1142	CONNECTOR(MALE)	1	
P41		VJP1221	CONNECTOR(MALE)	1	
P42		VJP1146	CONNECTOR(MALE) 10P	1	
P43		VJP1147	CONNECTOR(MALE)	1	
PW1		VJP1558	CONNECTOR(MALE)	1	
PW2		VJP1561	CONNECTOR(MALE)	1	
			RESISTORS		
R1		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
			MISCELLANEOUS		
		VJF0300	LED HOLDER	1	
		VMP1068	P.C.B.HOLDER ANGLE	1	
		VMP1069	P.C.B.HOLDER ANGLE	1	
		VMP1528	P.C.B.HOLDER ANGLE	1	
		VMP1736	P.C.B.HOLDER ANGLE	1	
		VMZ1251	BARRIER	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
		XTV3+10F	SCREW	20	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP88039A L1 TBC1 & SYNC GEN

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP88039A	P.C.BOARD W/COMPONENT		
L1			TBC1 & SYNC GEN		
			CAPACITORS		
C1,C2		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C3		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C4,C5		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C6		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C7		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C8,C9		ECQM1H472JV	P.CAPACITOR 50V 4700P	2	
C10		ECQM1H222JV	P.CAPACITOR 50V 2200P	1	
C11-60		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	50	
C61-89		VCKD1H104Z	C.CAPACITOR 50V 0.1U	29	
C150		ECQP1H221JZ	P.CAPACITOR 50V 220P	1	
C501		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C502		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C503		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C504		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C505		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C506		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C507		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C508		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C509		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C510		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C511		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C512		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C513		ECEA1EN100S	E.CAPACITOR 25V 10U	1	
C514		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C515		ECEA1EU100	E.CAPACITOR 25V 10U	1	
C516		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C517		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C518		ECQM1H473JV	P.CAPACITOR 50V 0.047U	1	
C519		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C520		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C521		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C522		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C523		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C524		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C525		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C526		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C527		ECQV1H564JZ	P.CAPACITOR 50V 0.56U	1	
C528-32		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C533		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C534		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C535		ECCF1H680JC	C.CAPACITOR 50V 68P	1	
C536-41		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	6	
C542		ECKF1H331KB	C.CAPACITOR 50V 330P	1	
C543,44		ECEA1CU100	E.CAPACITOR 16V 10U	2	
C545		ECCF1H090DC	C.CAPACITOR 50V 9P	1	
C546		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C547		ECEA0JU220	E.CAPACITOR 6.3V 22U	1	
C548,49		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C550		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C551		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C552		ECEA1HN2R2S	E.CAPACITOR 50V 2.2U	1	
C553		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C554		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C555,56		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C557		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C558		ECV1ZW20X53T	V.CAPACITOR 20P	1	
C559		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C560		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C561		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C562		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C563		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C564		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C565		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C566,67		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C568		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C569		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C570		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C571		ECKF1H102ZF	C.CAPACITOR 50V 1000P	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C572		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C573		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C574		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C575		ECEA1EN4R7S	E.CAPACITOR 25V 4.7U	1	
C576,77		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C578		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C579		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C580		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C581,82		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C583		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C584		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C585		ECCF1H471J	C.CAPACITOR 50V 470P	1	
C586		ECEA1AU330	E.CAPACITOR 10V 33U	1	
C587		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C589		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C590		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C591		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C597		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C598		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C599		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C600		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C602		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C603		ECCF1H271JC	C.CAPACITOR 50V 270P	1	
C604		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C613		ECQV1H394JZ	P.CAPACITOR 50V 0.39U	1	
C618		ECQV1H394JZ	P.CAPACITOR 50V 0.39U	1	
C621		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C622		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C623		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C624		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C625		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C626		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C630		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C631-35		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C636		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C637		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C638,39		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C640		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C641		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C642		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C643		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C644-47		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C648		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C649		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C658		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C659		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C670,71		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C672		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C673		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C674-76		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C677		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C678		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C679		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C680,81		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C682		ECEA0JU220	E.CAPACITOR 6.3V 22U	1	
C683		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C684		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C685		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C686		ECQV1H684JZ	P.CAPACITOR 50V 0.68U	1	
C687		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C688		ECEA0JU220	E.CAPACITOR 6.3V 22U	1	
C695		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C696		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C697		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C699		ECQB1H822J2	P.CAPACITOR 50V 8200P	1	
C700		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C701		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C702		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C703		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C704		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C705		ECQV1H224JZ	P.CAPACITOR 50V 0.22U	1	
C706,07		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C708		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C716		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C717		ECEA1CU470	E.CAPACITOR 16V 47U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C718		ECQB1H822JZ	P.CAPACITOR 50V 8200P	1	
C719		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C721		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C722		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C723		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C724		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C725		ECQM1H333JV	P.CAPACITOR 50V 0.033U	1	
C726		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C733-36		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C738		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C739		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C740		ECQM1H563JV	P.CAPACITOR 50V 0.056U	1	
C741,42		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	2	
C745-48		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C752		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C753		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C754		ECQV1H684JZ	P.CAPACITOR 50V 0.68U	1	
C755		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C756		ECEA0JKS220	E.CAPACITOR 6.3V 22U	1	
C761		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C763		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C801		ECQB1H822JZ	P.CAPACITOR 50V 8200P	1	
C802		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C803		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C806		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C807		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C808		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C809		ECQV1H224JZ	P.CAPACITOR 50V 0.22U	1	
C810		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C811,12		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C813		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C814		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C815		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C820,21		ECEA1CU220	E.CAPACITOR 16V 22U	2	
C823		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C837		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C840		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C842		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C845		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C846		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C900		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C901		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C902-11		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	10	
C1001,02		ECQM1H104JF	P.CAPACITOR 50V 0.1U	2	
C9100		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
D502		RD6.2EB2	ZENER 6.2V	1	
D503,04		MA165	DIODE	2	
D505		1SS101	DIODE	1	
D508		MA165	DIODE	1	
D511		MA165	DIODE	1	
D512		MA328R	DIODE	1	
D513		MA1091	DIODE	1	
D514-18		MA165	DIODE	5	
D519		RD16EB2	ZENER 16V	1	
D522-24		MA165	DIODE	3	
D525,26		MA328R	DIODE	2	
D531,32		MA328R	DIODE	2	
D533		MA1051	DIODE	1	
D534,35		MA165	DIODE	2	
D537		MA1051	DIODE	1	
D538		1S251	DIODE	1	
D539		MA165	DIODE	1	OR 1SS119, 1SS254
D542		MA1051	DIODE	1	
D543,44		MA165	DIODE	2	
D546		MA1051	DIODE	1	
D547		1S251	DIODE	1	
D548		MA165	DIODE	1	OR 1SS119, 1SS254
D551-53		MA165	DIODE	3	
D581		MA1051	DIODE	1	
D582,83		MA165	DIODE	2	
D584		MA1051	DIODE	1	
D585		1S251	DIODE	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
D586		MA165	DIODE	1	
FL501,02		VLF0545	FILTER	2	
IC2		MSM76H012GSK	IC	1	
IC3		N74F04N	IC	1	
IC4-C9		MB8464A80LSK	IC	6	
IC10		MB8464A80LSK	IC	1	
IC11		SN74LS221N	IC	1	
IC12		VSI0192	IC	1	
IC13		MSM71056	IC	1	
IC14		N74F04N	IC	1	
IC15		SN74S133N	IC	1	
IC16-22		MB8464A80LSK	IC	7	
IC23		N74F244N	IC	1	
IC24		MSM76H012GSK	IC	1	
IC25		N74F04N	IC	1	
IC26		SN74LS164N	IC	1	
IC34		SN74LS273N	IC	1	
IC35		N74F04N	IC	1	
IC43		SN74LS00N	IC	1	
IC45		SN74LS273N	IC	1	
IC46-49		HM6148HP-55	IC	4	
IC50		SN74LS161AN	IC	1	
IC51,52		SN74LS164N	IC	2	
IC54		N74F02N	IC	1	
IC55		SN74LS374N	IC	1	
IC56		SN74LS273N	IC	1	
IC57-60		HM6148HP-55	IC	4	
IC61		SN74LS161AN	IC	1	
IC62		N74F04N	IC	1	
IC63		SN74LS11N	IC	1	
IC64		N74F02N	IC	1	
IC65		SN74LS164N	IC	1	
IC66		SN74LS175N	IC	1	
IC67		UPD65010CW74	IC	1	
IC68		SN74LS273N	IC	1	
IC72		N74F109N	IC	1	
IC73		MC74HC00N	IC	1	
IC74		SN74LS164N	IC	1	
IC75		SN74LS00N	IC	1	
IC76		SN74LS175N	IC	1	
IC77		SN74LS273N	IC	1	
IC79		N74F04N	IC	1	
IC80		SN74LS109AN	IC	1	
IC81		SN74LS00N	IC	1	
IC82		SN74LS164N	IC	1	
IC83		SN74LS20N	IC	1	
IC85,86		SN74LS175N	IC	2	
IC88		SN74LS164N	IC	1	
IC90		SN74LS74AN	IC	1	
IC91		SN74LS166AN	IC	1	
IC92		SN74LS166ANS	IC	1	
IC100		UPD65013G101	IC	1	
IC101		SN74LS08N	IC	1	
IC102		SN74LS164N	IC	1	
IC103		SN74LS00N	IC	1	
IC104		N74F157AN	IC	1	
IC105		SN74LS74AN	IC	1	
IC106		UPD41101C1A	IC	1	
IC107		SN74LS374N	IC	1	
IC108		SN74LS74AN	IC	1	
IC109		SN74LS174N	IC	1	
IC110		SN74LS74AN	IC	1	
IC150		SN74LS02N	IC	1	
IC151		SN74LS157N	IC	1	
IC152		SN74LS221N	IC	1	
IC160		SN74LS157N	IC	1	
IC161		SN74LS00N	IC	1	
IC208		SN74LS374N	IC	1	
IC210		N74F04N	IC	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC501		TL810CPS	IC	1	
IC502		NE521N	IC	1	
IC503-05		SN74LS221NS	IC	3	
IC506		NJM082BM	IC	1	
IC507		AN612	IC	1	
IC508		MC14053BF	IC	1	
IC509		NJM082BM	IC	1	
IC510		TL810CPS	IC	1	
IC511		MC74HC109F	IC	1	
IC512		SN74AS109NS	IC	1	
IC513		DN74LS123S	IC	1	
IC514		MC74HC00F	IC	1	
IC515		NJM084M	IC	1	
IC517		SN74LS221NS	IC	1	
IC518		NJM1496M	IC	1	
IC519		SN7406N	IC	1	
IC520		MC74HC04F	IC	1	
IC521		MC74HC164F	IC	1	
IC522		MC14538BF	IC	1	
IC523		UPD65040G144	IC	1	
IC524		AN78L05	IC	1	
IC525		UPC324G	IC	1	
IC526		AN612	IC	1	
IC531		AN612	IC	1	
IC532		NJM082BM	IC	1	
IC533		AN78L05	IC	1	
IC534		NJM084M	IC	1	
IC535		MC74HC4053F	IC	1	
IC537		NJM084M	IC	1	
IC539		MC74HC74F	IC	1	
IC540		MC74HC164F	IC	1	
IC541		MC74HC4053F	IC	1	
IC542,43		MC74HC04F	IC	2	
IC545		N74F04D	IC	1	
IC547		MC74HC74F	IC	1	
IC548		MC74HC08F	IC	1	
IC551		NJM084M	IC	1	
IC552		AN78L05	IC	1	
IC554		MC74HC164F	IC	1	
IC560		MC74HC74F	IC	1	
IC562		MC74HC04F	IC	1	
IC564		SN74LS221NS	IC	1	
IC567		AN78L05	IC	1	
IC568		SN74LS221NS	IC	1	
IC569		MC74HC04F	IC	1	
IC570		MC74HC153F	IC	1	
IC571		MC74HC151F	IC	1	
IC572		MC14538BF	IC	1	
IC573		MC14053BF	IC	1	
IC574		MC74HC00F	IC	1	
IC575		MC14053BF	IC	1	
IC576		MC14538BF	IC	1	
IC577		MC74HC74F	IC	1	
IC581		UPD65040G144	IC	1	
IC583		TL810CPS	IC	1	
IC584		MN53015VZW	IC	1	
IC585,86		MC74HC74F	IC	2	
IC587		MC74HC00F	IC	1	
IC588		MC74HC08F	IC	1	
IC590		NJM082BM	IC	1	
IC591		MC14538BF	IC	1	
IC592,93		UPC311G	IC	2	
IC594		AN78L05	IC	1	
IC595		MC74HC08F	IC	1	
IC596		MC74HC04F	IC	1	
IC597		VSI0346	IC	1	
IC600,01		AN78L05	IC	2	
IC597S		VJS2332	CONNECTOR	1	
L1,L2		VLP0017	COIL	2	
L501-04		VLP0017	COIL	4	
L505,06		VLQEL06F470J	COIL 47UH	2	
L507		VLQEL06F101J	COIL 100UH	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
L508		VLQEL06F390J	COIL 39UH	1	
L509-14		VLQEL06F470J	COIL 47UH	6	
L515		VLQEL06F180J	COIL 18UH	1	
L516		VLQEL06F560J	COIL 56UH	1	
L517		VLQEL06F8R2J	COIL 8.2UH	1	
L520		VLQEL06F390J	COIL 39UH	1	
L521		VLQEL06F101J	COIL 100UH	1	
L522		VLQEL06F470J	COIL 47UH	1	
L525-27		VLQEL06F470J	COIL 47UH	3	
L531		VLQEL06F470J	COIL 47UH	1	
P1P		VJS1435	CONNECTOR(FEMALE)	1	
P2P		VJS1435	CONNECTOR(FEMALE)	1	
P3P		VJS1435	CONNECTOR(FEMALE)	1	
P4P		VJS1435	CONNECTOR(FEMALE)	1	
P7P		VJS1435	CONNECTOR(FEMALE)	1	
P8P		VJS1435	CONNECTOR(FEMALE)	1	
P5P-1,-2		VJS1435	CONNECTOR(FEMALE)	2	
P6P-1,-2		VJS1435	CONNECTOR(FEMALE)	2	
P1S		VJR0273	CONNECTOR	1	
P2S		VJR0273	CONNECTOR	1	
P3S		VJR0273	CONNECTOR	1	
P4S		VJR0273	CONNECTOR	1	
P7S		VJR0273	CONNECTOR	1	
P8S		VJR0273	CONNECTOR	1	
P5S-1,-2		VJR0273	CONNECTOR	2	
P6S-1,-2		VJR0273	CONNECTOR	2	
Q501-04		2SD636	TRANSISTOR	4	
Q505,06		2SB641	TRANSISTOR	2	
Q507		DTC124EA	TRANSISTOR RESISTOR	1	
Q511		2SC828	TRANSISTOR	1	
Q512		2SB641	TRANSISTOR	1	
Q513,14		2SC2206	TRANSISTOR	2	
Q515,16		2SK83	TRANSISTOR	2	
Q517		DTC124EA	TRANSISTOR RESISTOR	1	
Q518		2SC1216	TRANSISTOR	1	
Q519		2SD636	TRANSISTOR	1	
Q520		2SK301	TRANSISTOR	1	
Q521		2SD636	TRANSISTOR	1	
Q522		2SK301	TRANSISTOR	1	
Q523		DTC124EA	TRANSISTOR RESISTOR	1	
Q524		2SC1047	TRANSISTOR	1	
Q525		2SB641	TRANSISTOR	1	
Q526		2SD636	TRANSISTOR	1	
Q527,28		2SB641	TRANSISTOR	2	
Q529,30		2SD636	TRANSISTOR	2	
Q534		2SB641	TRANSISTOR	1	
Q535		2SC2206	TRANSISTOR	1	
Q536		DTC124EA	TRANSISTOR RESISTOR	1	
Q545		DTC124EA	TRANSISTOR RESISTOR	1	
Q547		2SC2206	TRANSISTOR	1	
Q548		2SB641	TRANSISTOR	1	
Q549		2SC2206	TRANSISTOR	1	
Q550		2SB641	TRANSISTOR	1	
Q555		2SC2206	TRANSISTOR	1	
Q556		2SB641	TRANSISTOR	1	
Q557		2SC2206	TRANSISTOR	1	
Q558		2SB641	TRANSISTOR	1	
Q559		2SD636	TRANSISTOR	1	
Q562		2SD636	TRANSISTOR	1	
Q565		2SC1216	TRANSISTOR	1	
Q566		DTC124EA	TRANSISTOR RESISTOR	1	
Q571		2SD636	TRANSISTOR	1	
			RESISTORS		
R5		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R10		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R11,12		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	2	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R13		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R15,16		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R17		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R18,19		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R21,22		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R25		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R70,71		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R150		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R151		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R160		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R201		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R501		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R502		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R503,04		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R505		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R506		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R507		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R508		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R509		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R510		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R511		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R512		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R513		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R514		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R515		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R516		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R517		EROS2CHG3001	M.RESISTOR 1/4W 3K	1	
R519		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R520		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R521		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R522		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R523		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R524		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R525		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R526,27		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R528		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R531		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R532		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R533		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R534,35		ERDS2TJ105	C.RESISTOR 1/4W 1000K	2	
R544		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R545-47		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R548		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R549		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R551		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R552		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R553		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R554		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R555		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R556	*	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R557		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R558		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R559		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R560		ERDS2TJ334	C.RESISTOR 1/4W 330K	1	
R561		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R562		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R563		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R564		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R565		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R566		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R567		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R568		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R569		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R570		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R571		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R572		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R573		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R574,75		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R576,77		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R578		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R579		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R580		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R583,84		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R585		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R586		EROS2CHG8200	M.RESISTOR 1/4W 820	1	
R587		EROS2CHG3901	M.RESISTOR 1/4W 3.9K	1	
R588		EROS2CHG1002	M.RESISTOR 1/4W 10K	1	
R589		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R590		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R591		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R592		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R593		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R594		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R595		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R596,97		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	2	
R598		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R599,00		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R601		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R602		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R603		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R604		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R605,06		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	2	
R607		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R608,09		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R610		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R611		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R612		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R613		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R614		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R615,16		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R617		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R618		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R619		ERTD2FHL102S	THERMISTOR 1K	1	
R620		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R621		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R622-24		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R625		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R626		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R627		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R628,29		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R630		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R631		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R632		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R633		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R634,35		ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R636		EROS2CKF75R0	M.RESISTOR 1/4W 75	1	
R640		ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R642		ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R643		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R645		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R646		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R647		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R648		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R649		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R650		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R651		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R664		ERDS2TJ564	C.RESISTOR 1/4W 560K	1	
R674		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R675		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R678,79		ERDS2TJ271	C.RESISTOR 1/4W 270	2	
R680		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R681		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R682		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R683		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R684		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R685		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R686,87		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R694		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R695		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R697		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R700,01		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R702		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R703,04		ERDS2TJ154	C.RESISTOR 1/4W 150K	2	
R705		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R706		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R707		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R708		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R709		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R710		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R711		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R712		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R713		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R714		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R715		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R716		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R717		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R718		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R726		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R727		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R728		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R730		EROS2CHG1002	M.RESISTOR 1/4W 10K	1	
R731		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R732		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R733		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R734		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R735		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R736		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R737		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R738		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R739		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R749		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R750		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R752		EROS2CHG1002	M.RESISTOR 1/4W 10K	1	
R753		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R754		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R755		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R756		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R757		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R758		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R759		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R760		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R761		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R770,71		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R772,73		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R774,75		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R776		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R777,78		ERDS2TJ154	C.RESISTOR 1/4W 150K	2	
R779		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R780		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R781		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R782,83		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R784		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R785,86		ERDS2TJ154	C.RESISTOR 1/4W 150K	2	
R787		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R788,89		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R790		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R791		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R801		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R802		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R803		EROS2CKF1002	M.RESISTOR 1/4W 10K	1	
R804		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R805		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R806		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R807		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R808		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R809		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R810		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R811		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R812		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R819		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R820		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R821,22		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R823,24		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R825		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R826,27		ERDS2TJ154	C.RESISTOR 1/4W 150K	2	
R828		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R829		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R830		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R832,33		ERDS2TJ824	C.RESISTOR 1/4W 820K	2	
R834		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R835		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R837		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R838-40		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R841		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R842		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R843		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R844		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R845		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R846		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R847		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R848		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R849		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R850		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R851		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R852		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R853		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R854,55		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R856-58		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R861		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R862		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R863		ERDS2TJ334	C.RESISTOR 1/4W 330K	1	
R864		ERDS2TJ564	C.RESISTOR 1/4W 560K	1	
R865		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R1201		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
RA2-A9		EXBR88332J	RESISTOR & RESISTOR 3.3K	8	
RA10-17		EXBR88332J	RESISTOR & RESISTOR 3.3K	8	
RA21		EXBP44103J	COMBI R-R 10K	1	
RA22		EXBR88103J	RESISTOR & RESISTOR 10K	1	
RA201		EXBR88332J	RESISTOR & RESISTOR 3.3K	1	
RA501-03		EXBR84103J	RESISTOR&RESISTOR 10K	3	
SW2		VST0091	SWITCH	1	
SW3		VSS0241	SWITCH	1	
SW4,W5		VJP1990	CONNECTOR	2	
SW8		VJP1990	CONNECTOR	1	
SW504		VJP1990	CONNECTOR	1	
SW503-S		VJS1990	CONNECTOR	1	
SW502-1,-2		VJP1990	CONNECTOR	2	
SW503-1,-2		VJP1990	CONNECTOR	2	
SW4S		VJS1990	CONNECTOR	1	
SW5S		VJS1990	CONNECTOR	1	
SW8S		VJS1990	CONNECTOR	1	
SW502S		VJS1990	CONNECTOR	1	
SW504S		VJS1990	CONNECTOR	1	
TP501-09		VJR0400Y	TEST POINT	9	
TP511-13		VJR0400Y	TEST POINT	3	
TP517,18		VJR0400Y	TEST POINT	2	
TP520-27		VJR0400Y	TEST POINT	8	
TP529-34		VJR0400Y	TEST POINT	6	
TP541-45		VJR0400Y	TEST POINT	5	
TPG1-G4		VJR0400B	TEST POINT	4	
TPG501-04		VJR0400B	TEST POINT	4	
VR501,02		VRV0109B503	V.RESISTOR 50K	2	
VR503		VRV0109B502	V.RESISTOR 5K	1	
VR504		VRV0109B102	V.RESISTOR 1K	1	
VR505		VRV0109B502	V.RESISTOR 5K	1	
VR506,07		VRV0109B103	V.RESISTOR 10K	2	
VR508		VRV0109B203	V.RESISTOR 20K	1	
VR509		VRV0109B502	V.RESISTOR 5K	1	
VR510		VRV0109B503	V.RESISTOR 50K	1	
VR512		VRV0109B102	V.RESISTOR 1K	1	
VR514		VRV0109B102	V.RESISTOR 1K	1	
VR515,16		VRV0109B502	V.RESISTOR 5K	2	
VR518		VRV0109B103	V.RESISTOR 10K	1	
VR521,22		VRV0110B502	V.RESISTOR 5K	2	
VR523		VRV0109B202	V.RESISTOR 2K	1	
VR524		VRV0109B502	V.RESISTOR 5K	1	
VR525		VRV0109B103	V.RESISTOR 10K	1	
VR1001		VRV0109B502	V.RESISTOR 5K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
X501		VSX0114	CRYSTAL OSCILLATOR	1	
X504		VSX0270	CRYSTAL OSCILLATOR	1	
X508		VSX0270	CRYSTAL OSCILLATOR	1	
X509-11		VSX0280	CRYSTAL OSCILLATOR	3	
			MISCELLANEOUS		
		VJF0300	BINDER	9	
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VSC1413	SHIELD CASE	1	
		VXA2246	P.C.B.SHIELD PLATE	1	
		XYNV3+K6FR	SCREW	6	
	■	VEP88046B	P.C.BOARD W/COMPONENT		PART OF VEP88039A
			TBC1 SUB1		
			CAPACITORS		
C7		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C61-84		VCKD1H104Z	C.CAPACITOR 50V 0.1U	24	
C85		VCKD1H104Z	C.CAPACITOR 50V 0.1U	1	
C86		VCKD1H104Z	C.CAPACITOR 50V 0.1U	1	
C87		VCKD1H104Z	C.CAPACITOR 50V 0.1U	1	
C88		VCKD1H104Z	C.CAPACITOR 50V 0.1U	1	
C89		VCKD1H104Z	C.CAPACITOR 50V 0.1U	1	
IC2		MSM76H012GSK	IC	1	
IC3		N74F04N	IC	1	
IC4-C9		MB8464A80LSK	IC	6	
IC10		MB8464A80LSK	IC	1	
IC11		SN74LS221N	IC	1	
IC12		VSI0192	IC	1	
IC13		MSM71056	IC	1	
IC14		N74F04N	IC	1	
IC16-22		MB8464A80LSK	IC	7	
IC23		N74F244N	IC	1	
IC24		MSM76H012GSK	IC	1	
IC25		N74F04N	IC	1	
IC34		SN74LS273N	IC	1	
IC35		N74F04N	IC	1	
IC54		N74F02N	IC	1	
IC91		SN74LS166N	IC	1	
IC92		SN74LS166ANS	IC	1	
IC208		SN74LS374N	IC	1	
P1S		VJR0273	CONNECTOR	1	
P2S		VJR0273	CONNECTOR	1	
P3S		VJR0273	CONNECTOR	1	
P4S		VJR0273	CONNECTOR	1	
P7S		VJR0273	CONNECTOR	1	
P8S		VJR0273	CONNECTOR	1	
P5S-1,-2		VJR0273	CONNECTOR	2	
P6S-1,-2		VJR0273	CONNECTOR	2	
			RESISTORS		
R5		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R71		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
RA4-A9		EXBR88332J	RESISTOR & RESISTOR 3.3K	6	
RA10-17		EXBR88332J	RESISTOR & RESISTOR 3.3K	8	

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VEP88020B L2 TBC2

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP88020B	P.C.BOARD W/COMPONENT		
L2			TBC 2		
			CAPACITORS		
C1		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C2		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C3		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C4		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C5		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C6		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C7		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C8		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C10		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C11		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	11	
C12		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C13		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C14		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C15		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C16		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C17		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C18		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C19		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C20		ECQM1H472JV	P.CAPACITOR 50V 4700P	1	
C21		ECQM1H823JV	P.CAPACITOR 50V 0.082U	1	
C22,23		ECQM1H122JV	P.CAPACITOR 50V 1200P	2	
C24		ECQM1H222JV	P.CAPACITOR 50V 2200P	1	
C26		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C27		ECQM1H472JV	P.CAPACITOR 50V 4700P	1	
C28		ECQM1H222JV	P.CAPACITOR 50V 2200P	1	
C29		ECQM1H122JV	P.CAPACITOR 50V 1200P	1	
C30,31		ECQM1H122JV	P.CAPACITOR 50V 1200P	1	
C32		ECEA0JN101SB	E.CAPACITOR 6.3V 100U	1	
C33		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C34		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C35		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C36		ECEA1EN4R7SB	E.CAPACITOR 25V 4.7U	1	
C37		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C38		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C39		ECQM1H103JV	P.CAPACITOR 50V 0.01U	2	
C40		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C41,42		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C43		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C44		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C45		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C46		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C47		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C48		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C49		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C50		ECCF1H271JC	C.CAPACITOR 50V 270P	1	
C51,52		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C53		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C54		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C55		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C56		ECQM1H472JV	P.CAPACITOR 50V 4700P	1	
C57		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C58		ECQM1H152JV	P.CAPACITOR 50V 1500P	1	
C59		ECEA1HUR47	E.CAPACITOR 50V 0.47U	1	
C60		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C61,62		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C63,64		ECKF1H471KB	C.CAPACITOR 50V 470P	2	
C65,66		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C67		ECEA0JN101SB	E.CAPACITOR 6.3V 100U	1	
C68		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C69		ECEA1EN4R7SB	E.CAPACITOR 25V 4.7U	1	
C70		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C71		ECCF1H270JC	C.CAPACITOR 50V 27P	1	
C72		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C73,74		ECCF1H101JC	C.CAPACITOR 50V 100P	2	
C75		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C76		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C77		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C78		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C79		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C80		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C81		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C82		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C83		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C84		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C85		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C86		ECQM1H472JV	P.CAPACITOR 50V 4700P	1	
C87		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C88		ECQM1H152JV	P.CAPACITOR 50V 1500P	1	
C89		ECEA1HUR47	E.CAPACITOR 50V 0.47U	1	
C90		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C91		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C92		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C93		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C94		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C95-99		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C100-40		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	41	
C200		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C201		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C202		ECEA1CN100SB	E.CAPACITOR 16V 10U	1	
C203		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C204		ECQM1H122JV	P.CAPACITOR 50V 1200P	1	
C205		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C206		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C207		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C208		ECEA1AU220	E.CAPACITOR 10V 22U	1	
C209-11		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C212		ECKF1H561KB	C.CAPACITOR 50V 560P	1	
C213		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C214		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C215		ECEA1AU220	E.CAPACITOR 10V 22U	1	
C216		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C217		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C218		ECEA1AU220	E.CAPACITOR 10V 22U	1	
C220		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C221		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C223		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C224		ECCF1H050CC	C.CAPACITOR 50V 5P	1	
C225		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C226		ECEA1CN100SB	E.CAPACITOR 16V 10U	1	
C227,28		ECCF1H330JC	C.CAPACITOR 50V 33P	2	
C229		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C230		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C231		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C232		ECQM1H122JV	P.CAPACITOR 50V 1200P	1	
C233		ECEA1AU220	E.CAPACITOR 10V 22U	1	
C234		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C235		ECEA1HUR47	E.CAPACITOR 50V 0.47U	1	
C236		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C237		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C238		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C239		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C240,41		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C242		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C243		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C244		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C245		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C246,47		ECEA1CU220	E.CAPACITOR 16V 22U	2	
C248		ERDS2T0	C.RESISTOR 1/4W 0	1	
C249		ECKF1H391KB	C.CAPACITOR 50V 390P	1	
C250		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C251		ECKF1H391KB	C.CAPACITOR 50V 390P	1	
C252		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C253		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C254		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C255		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C256		ERDS2T0	C.RESISTOR 1/4W 0	1	
C257		ECKF1H391KB	C.CAPACITOR 50V 390P	1	
C258		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C259		ECKF1H391KB	C.CAPACITOR 50V 390P	1	
C260		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C261		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C262-68		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	7	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C272-77		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	6	
C279-13		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	35	
C315-20		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	6	
C350		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C351		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C352		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C500,01		ECCF1H151JC	C.CAPACITOR 50V 150P	2	
D1		MA165	DIODE	1	
D4-D6		MA165	DIODE	3	
D8,D9		MA165	DIODE	2	
D10-12		MA165	DIODE	3	
D13		RD5.6EB2	ZENER 5.6V	1	
D14-20		MA165	DIODE	7	
D21		1SS101	DIODE	1	
D22,23		MA165	DIODE	2	
D24		RD10EB2	ZENER 10V	1	
D25		MA165	DIODE	1	
D26		MA328R	DIODE	1	
D27-39		MA165	DIODE	13	
IC1		SN74LS00N	IC	1	
IC2		SN74LS04N	IC	1	
IC3		SN74LS74AN	IC	1	
IC4,C5		HA17084P	IC	2	
IC7		UPD5201C	IC	1	
IC8		UPC339C	IC	1	
IC9		SN74LS86N	IC	1	
IC10		SN74LS221N	IC	1	
IC11		SN74LS00N	IC	1	
IC12		SN74LS08N	IC	1	
IC13		SN74LS157N	IC	1	
IC14		SN74LS123N	IC	1	
IC15		SN74LS221N	IC	1	
IC16		MC14040BCP	IC	1	
IC17		MC14082BCP	IC	1	
IC18		SN74LS74AN	IC	1	
IC19		SN74LS161AN	IC	1	
IC20		SN74LS00N	IC	1	
IC21		SN74LS374N	IC	1	
IC22		SN74LS157N	IC	1	
IC23		SN74LS02N	IC	1	
IC24		SN74LS74AN	IC	1	
IC25,26		SN74LS161AN	IC	2	
IC27		VSI0257	IC	1	
IC28		SN74LS273N	IC	1	
IC29		SN74LS112AN	IC	1	
IC30		HA17084P	IC	1	
IC31		UPC319C	IC	1	
IC32		UPC398C	IC	1	
IC33		SN74LS221N	IC	1	
IC34		MC1414P	IC	1	
IC35		UPC398C	IC	1	
IC36		SN74LS221N	IC	1	
IC37		SN74LS04N	IC	1	
IC38		SN74LS123N	IC	1	
IC39		SN74LS04N	IC	1	
IC40		SN74LS00N	IC	1	
IC41		SN74LS221N	IC	1	
IC42		SN74LS00N	IC	1	
IC43		SN74LS08N	IC	1	
IC45		UPC319C	IC	1	
IC46		SN74LS221N	IC	1	
IC47		UPC4560C	IC	1	
IC48		HI-201-5	IC	1	
IC49		HA17084P	IC	1	
IC50		HA17082PS	IC	1	
IC51,52		MC14053BCP	IC	2	
IC53		HA-4905-5	IC	1	
IC54		SN74LS11N	IC	1	
IC55		SN74LS00N	IC	1	
IC56		SN74LS74AN	IC	1	
IC58		UPC319C	IC	1	
IC59		SN74LS221N	IC	1	
IC60		UPC4560C	IC	1	
IC61		HI-201-5	IC	1	
IC62		HA17084P	IC	1	
IC63		HA17082PS	IC	1	
IC64,65		MC14053BCP	IC	2	
IC66		HA-4905-5	IC	1	
IC67		SN74LS11N	IC	1	
IC68		SN74LS00N	IC	1	
IC69		SN74LS123N	IC	1	
IC70		SN74LS02N	IC	1	
IC71		MC14053BCP	IC	1	
IC72		HA17082PS	IC	1	
IC73		HA17084P	IC	1	
IC74		AN79L05	IC	1	
IC75		MC1648P	IC	1	
IC76		AN78L05	IC	1	
IC77		SN74LS175N	IC	1	
IC78		SN74LS74AN	IC	1	
IC79		HD10125	IC	1	
IC80		N74F109N	IC	1	
IC81		SN74LS374N	IC	1	
IC82,83		SN74LS161AN	IC	2	
IC84		SN74LS92N	IC	1	
IC85		SN74LS123N	IC	1	
IC86		SN74LS221N	IC	1	
IC87		SN74LS109AN	IC	1	
IC88		AN78L05	IC	1	
IC89		MC14053BCP	IC	1	
IC90		HA17902P	IC	1	
IC91		SN74LS624N	IC	1	
IC92		SN74LS30N	IC	1	
IC93-95		SN74LS161AN	IC	3	
IC96		CA3054	IC	1	
IC97		MC1414P	IC	1	
IC98		N74F04N	IC	1	
IC99		N74F00N	IC	1	
IC100		MC74HC00N	IC	1	
IC101		SN74LS123N	IC	1	
IC102-04		N74F74N	IC	3	
IC105		N74F244N	IC	1	
IC106		N74F374N	IC	1	
IC107		SN74LS148N	IC	1	
IC108		N74F151N	IC	1	
IC109		UPC358C	IC	1	
IC110		SN74LS123N	IC	1	
IC111-13		N74F74N	IC	3	
IC114		N74F244N	IC	1	
IC115		N74F374N	IC	1	
IC116		SN74LS148N	IC	1	
IC117		N74F151N	IC	1	
IC118		N74F157N	IC	1	
IC119		SN74LS221N	IC	1	
IC120,21		SN74LS161AN	IC	2	
IC122		SN74LS00N	IC	1	
IC123		VSI0255	IC	1	
IC124		SN74LS175N	IC	1	
IC125		SN74LS109AN	IC	1	
IC126,27		SN74LS161AN	IC	2	
IC128		VSI0256	IC	1	
IC129		SN74LS175N	IC	1	
IC130,31		SN74LS74AN	IC	2	
IC132,33		SN74LS161AN	IC	2	
IC134		N74F00N	IC	1	
IC135-37		M74ALS161AP	IC	3	
IC138		N74F04N	IC	1	
IC139		SN74LS161AN	IC	1	
IC140		N74F04N	IC	1	
IC141,42		N74F00N	IC	2	
IC143		SN74LS161AN	IC	1	
IC144		HA17084P	IC	1	
IC145,46		SN74LS161AN	IC	2	
IC147		SN74LS86N	IC	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC148		SN74LS04N	IC	1	
IC149		SN74S133N	IC	1	
IC150		SN74LS74AN	IC	1	
IC151		N74F374N	IC	1	
IC152		SN74LS148N	IC	1	
IC153		N74F08N	IC	1	
IC154		N74F151N	IC	1	
IC155		N74F244N	IC	1	
IC156		N74F374N	IC	1	
IC157		SN74LS148N	IC	1	
IC158		N74F08N	IC	1	
IC159		N74F151N	IC	1	
IC161		N74F244N	IC	1	
IC200		SN74LS20N	IC	1	
IC400		N74F157N	IC	1	
L1-L9		VLP0017	COIL	9	
L10		VLQEL06F151J	COIL 150UH	1	
L11		VLQ0144	COIL	1	
L12		VLQEL06F470J	COIL 47UH	1	
L15		ERDS2T0	C.RESISTOR 1/4W 0	1	
L16		VLQEL06F5R6J	COIL 5.6UH	1	
L17		VLQEL06F390J	COIL 39UH	1	
L18		VLQEL06F5R6J	COIL 5.6UH	1	
L19		ERDS2T0	C.RESISTOR 1/4W 0	1	
L20		VLQEL06F5R6J	COIL 5.6UH	1	
L21		VLQEL06F390J	COIL 39UH	1	
L22		VLQEL06F5R6J	COIL 5.6UH	1	
L100,01		VLQEL06F100J	COIL 10UH	2	
Q1		2SB641	TRANSISTOR	1	
Q2		2SA564	TRANSISTOR	1	
Q3		2SK301	TRANSISTOR	1	
Q4		2SB641	TRANSISTOR	1	
Q5		2SD636	TRANSISTOR	1	
Q6,Q7		2SC2206	TRANSISTOR	2	
Q8		2SA564	TRANSISTOR	1	
Q9		2SK301	TRANSISTOR	1	
Q10		2SB641	TRANSISTOR	1	
Q11		2SD636	TRANSISTOR	1	
Q12,13		2SC2206	TRANSISTOR	2	
Q14		2SA564	TRANSISTOR	1	
Q15,16		2SD636	TRANSISTOR	2	
Q17		2SB641	TRANSISTOR	1	
Q18-21		2SD636	TRANSISTOR	4	
Q22		2SB641	TRANSISTOR	1	
Q23,24		2SD636	TRANSISTOR	2	
Q25		DTC124EA	TRANSISTOR RESISTOR	1	
Q27-31		DTC124EA	TRANSISTOR RESISTOR	5	
Q32		2SD636	TRANSISTOR	1	
			RESISTORS		
R1		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R2		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R3		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R4,R5		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R6,R7		ERDS2TJ683	C.RESISTOR 1/4W 68K	2	
R8,R9		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R10		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R11		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R13		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R15		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R16		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R17		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R18		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R19		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R20		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R21		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R22		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R23		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R24		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R25		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R26,27		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	2	
R28		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R29		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R30		ERDS2TJ155	C.RESISTOR 1/4W 1.5M	1	
R31		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R32		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R33		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R34		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R35,36		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	2	
R37		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R38,39		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R40		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R41		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R42		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R43		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R44		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R45		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R46		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R47		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R48		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R49		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R50		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R51		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R52		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R54		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R55		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R56		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R57		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R58		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R59		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R60		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R61		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R62,63		ERDS2TJ681	C.RESISTOR 1/4W 680	2	
R64		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R65		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R66,67		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R68		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R69		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R70		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R71		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R72-74		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R75		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R76		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R77,78		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R79		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R80		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R81,82		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R83		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R84		ERDS2TJ181	C.RESISTOR 1/4W 180	1	
R85,86		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R87		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R88		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R89		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R90		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R91		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R92		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R93,94		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	2	
R95		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R96		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R97		ERDS2TJ155	C.RESISTOR 1/4W 1.5M	1	
R98		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R99		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R100		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R101		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R102		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R103		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R104		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R105		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R106		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R107		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R109		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R110		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R111		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R112		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R113		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R114		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R115		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R116		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R117		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R118		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R119		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R120		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R121		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R122		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R123		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R124		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R125		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R126		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R127		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R128		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R129,30		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R131		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R132		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R133		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R134		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R135,36		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R137		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R138		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R139,40		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R141		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R142		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R143,44		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R145		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R146		ERDS2TJ181	C.RESISTOR 1/4W 180	1	
R147,48		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R149		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R150		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R151		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R153		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R154		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R155		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R156		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R157		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R158		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R159		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R160		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R161		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R162		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R163		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R164		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R165		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R166		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R167		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R168		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R169		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R170		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R172		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R174		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R175		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R176		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R177		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R178		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R179-81		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R182		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R183		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R184		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R185		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R186		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R187		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R188		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R189		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R190		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R191,92		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R193		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R194		ERDS2TJ155	C.RESISTOR 1/4W 1.5M	1	
R195		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R196,97		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R198		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R199		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R201		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R202		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R203,04		ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R205		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R206,07		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R208		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R209		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R210		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R211		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R212		EROS2CHF3000	M.RESISTOR 1/4W 300	1	
R213		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R214		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R215		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R216		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R217		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R218		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R219		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R220,21		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	2	
R222,23		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R224		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R225		ERDS2TJ121	C.RESISTOR 1/4W 120	1	
R226		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R227		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R228		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R229		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R230		EROS2CHF3000	M.RESISTOR 1/4W 300	1	
R231		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R232		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R233		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R234,35		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R237		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R238		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R239		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R240		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R241		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R250		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R251		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R300,01		ERDS2TJ105	C.RESISTOR 1/4W 1000K	2	
R302		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R303		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R310		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R350		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R400		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
RA1		EXBR86103J	RESISTOR & RESISTOR 10K	1	
RA2		EXBR88103J	RESISTOR & RESISTOR 10K	1	
RA3		EXBR84103J	RESISTOR&RESISTOR 10K	1	
RA4,A5		EXBR84222J	RESISTOR & RESISTOR 2.2K	2	
SW1P		VJP1990	CONNECTOR	1	
SW1S		VJS1990	CONNECTOR	1	
TP1-P7		VJR0400Y	TEST POINT	7	
TP9		VJR0400Y	TEST POINT	1	
TP10-13		VJR0400Y	TEST POINT	4	
TP16-25		VJR0400Y	TEST POINT	10	
TP30-34		VJR0400Y	TEST POINT	4	
TPG1-G6		VJR0400B	TEST POINT	6	
VR2		VRV0063B102	V.RESISTOR 1K	1	
VR3		VRV0063B502	V.RESISTOR 5K	1	
VR6		VRV0063B502	V.RESISTOR 5K	1	
VR8		VRV0063B502	V.RESISTOR 5K	1	
VR9		VRV0064B202	V.RESISTOR 2K	1	
VR10		VRV0064B202	V.RESISTOR 2K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR11,12		VRV0063B502	V.RESISTOR 5K	2	
VR13		VRV0063B102	V.RESISTOR 1K	1	
X1		VSX0211	CRYSTAL OSCILLATOR	1	
			MISCELLANEOUS		
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VSC1878	SHIELD CASE	1	
		VSC1879	SHIELD CASE	1	
		VXA2246	P.C.B. SHIELD PLATE	1	
		XYNV3+K6FR	SCREW	6	
	■	VEP80467A	P.C.BOARD W/COMPONENT		PART OF VEP88020B
			TBC2 SUB1		
IC201		MC74F109M	IC	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP88040A L3 ENCODER

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP88040A	P.C.BOARD W/COMPONENT		
L3			ENCODER		
			CAPACITORS		
C1		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C2		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C3		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C4		ECEA1AU221	E.CAPACITOR 10V 220U	1	
C5		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C6		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C7		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C8		ECEA1AU221	E.CAPACITOR 10V 220U	1	
C9		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C10		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C11,12		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C14		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C15		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C16,17		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C18		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C19		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C20		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C21-24		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C25		ECEA0JU221	E.CAPACITOR 6.3V 220U	1	
C26		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C27		ECEA0JU221	E.CAPACITOR 6.3V 220U	1	
C28-37		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	10	
C39		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C40		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C42		ECEA1EN4R7S	E.CAPACITOR 25V 4.7U	1	
C44		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C45		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C46		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C47		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C48-50		ECEA1CU101	E.CAPACITOR 16V 100U	3	
C52		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C53		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C54		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C55		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C56		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C57		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C58		ECQV1H224JZ	P.CAPACITOR 50V 0.22U	1	
C59		ECEA1HN2R2S	E.CAPACITOR 50V 2.2U	1	
C60		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C61		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C62		ECEA1CN100SB	E.CAPACITOR 16V 10U	1	
C63		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C64		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C65		ECEA1EN4R7SB	E.CAPACITOR 25V 4.7U	1	
C66		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C67		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C68		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C69,70		ECCF1H151JC	C.CAPACITOR 50V 150P	2	
C71		ECCF1H270JC	C.CAPACITOR 50V 27P	1	
C72		ECEA1CKS101	E.CAPACITOR 16V 100U	1	
C73,74		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C75		ECCF1H040DC	C.CAPACITOR 50V 4P	1	
C77		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C78		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C79		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C80		ECEA1EN4R7S	E.CAPACITOR 25V 4.7U	1	
C81		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C82		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C83		ECEA0JU221	E.CAPACITOR 6.3V 220U	1	
C84		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C85		ECEA0JU221	E.CAPACITOR 6.3V 220U	1	
C86-96		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	11	
C98		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C99		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C100		ECEA1HN2R2S	E.CAPACITOR 50V 2.2U	1	
C101		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C102		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C103		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C104		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C105		ECCF1H270JC	C.CAPACITOR 50V 27P	1	
C106		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C107		ECCF1H270JC	C.CAPACITOR 50V 27P	1	
C108		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C110,11		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C113		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C114		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C115,16		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C117,18		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C119		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C120		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C121		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C122		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C123		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C127		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C128		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C140		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C141		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C142		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C150		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C151		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C152		ECCF1H120JC	C.CAPACITOR 50V 12P	1	
C200		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C201		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C202		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C203		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C204		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C205		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C206		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C207		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C208		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C209		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C210		ECEA0JU221	E.CAPACITOR 6.3V 220U	1	
C211		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C212		ECEA1AU471	E.CAPACITOR 10V 470U	1	
C213		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C214		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C215		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C216		ECEA1AU221	E.CAPACITOR 10V 220U	1	
C217,18		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C219		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C220,21		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C222		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C223		ECEA1AU470	E.CAPACITOR 10V 47U	1	
C224		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C226		ECEA1AU470	E.CAPACITOR 10V 47U	1	
C227-29		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C230		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C231,32		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C233		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C234		ECCF1H120JC	C.CAPACITOR 50V 12P	1	
C235,36		ECEA1AU331	E.CAPACITOR 10V 330U	2	
C237		ECCF1H120JC	C.CAPACITOR 50V 12P	1	
C238		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C239		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C240		ECCF1H050CC	C.CAPACITOR 50V 5P	1	
C241		ECEA1HNR47SB	E.CAPACITOR 50V 0.47U	1	
C242		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C243		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C244		ECCF1H120JC	C.CAPACITOR 50V 12P	1	
C245,46		ECEA1AU331	E.CAPACITOR 10V 330U	2	
C247		ECCF1H120JC	C.CAPACITOR 50V 12P	1	
C248		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C249		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C250		ECCF1H040CC	C.CAPACITOR 50V 4P	1	
C251		ECEA1HNR47SB	E.CAPACITOR 50V 0.47U	1	
C252		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C253		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C254		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C255,56		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C257		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C258		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C259		ECCF1H050CC	C.CAPACITOR 50V 5P	1	
C260		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C261		ECEA1CU330	E.CAPACITOR 16V 33U	1	
C262		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C263,64		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C265		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C266		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C267		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C268,69		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C270		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C271		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C272		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C273		ECCF1H120JC	C.CAPACITOR 50V 12P	1	
C274		ECQP1H111JZ	P.CAPACITOR 50V 110P	1	
C275		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C276,77		ECEA1AU470	E.CAPACITOR 10V 47U	2	
C278		ECEA1CN330S	E.CAPACITOR 16V 33U	1	
C279		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C280		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C281		ECEA1AU471	E.CAPACITOR 10V 470U	1	
C282		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C283		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C284		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C285,86		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C287		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C288		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C289,90		ECEA1AU101	E.CAPACITOR 10V 100U	2	
C291		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C292,93		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C294		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C295		ECEA1AU221	E.CAPACITOR 10V 220U	1	
C296		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C297		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C298		ECCF1H050CC	C.CAPACITOR 50V 5P	1	
C299		ECEA1HNR47SB	E.CAPACITOR 50V 0.47U	1	
C300		ECEA1AU221	E.CAPACITOR 10V 220U	1	
C301		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C302		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C303		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C304		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C305		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C306		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C307		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C308		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C309		ECEA1AU471	E.CAPACITOR 10V 470U	1	
C310		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C311		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C312		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C313,14		ECEA1AU101	E.CAPACITOR 10V 100U	2	
C315		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C316,17		ECCF1H050CC	C.CAPACITOR 50V 5P	2	
C318		ECEA1HNR47SB	E.CAPACITOR 50V 0.47U	1	
C319		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C320		ECEA1HNR47SB	E.CAPACITOR 50V 0.47U	1	
C321		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C322		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C323		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C324		ECEA1CU330	E.CAPACITOR 16V 33U	1	
C325		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C326,27		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C328		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C329		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C330		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C331		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C332		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C333		ECCF1H100DC	C.CAPACITOR 50V 10P	1	
C334		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C335		ECCF1H271JC	C.CAPACITOR 50V 270P	1	
C336		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C337		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C338		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C339,40		ECCF1H330JC	C.CAPACITOR 50V 33P	2	
C341		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C342-44		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C346		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C347		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C349		ECEA1HNR47SB	E.CAPACITOR 50V 0.47U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C350		ECCF1H270JC	C.CAPACITOR 50V 27P	1	
C353-56		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C413		ECQM1H272JV	P.CAPACITOR 50V 2700P	1	
C414		ECQM1H182JV	P.CAPACITOR 50V 1800P	1	
C415		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C416-18		ECKF1H122KB	C.CAPACITOR 50V 1200P	3	
C419		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C420		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C421		ECEA1AU470	E.CAPACITOR 10V 47U	1	
C426		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C427		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C428		ECQM1H222JV	P.CAPACITOR 50V 2200P	1	
C432,33		ECKF1H122KB	C.CAPACITOR 50V 1200P	2	
C434		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C435		ECEA1AU470	E.CAPACITOR 10V 47U	1	
C440		ECQM1H152JV	P.CAPACITOR 50V 1500P	1	
C441		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C446		ECQM1H222JV	P.CAPACITOR 50V 2200P	1	
C447		ECQM1H682JV	P.CAPACITOR 50V 6800P	1	
C452,53		ECKF1H102KB	C.CAPACITOR 50V 1000P	2	
C456		ECCF1H121KC	C.CAPACITOR 50V 120P	1	
C459,60		ECEA1CU330	E.CAPACITOR 16V 33U	2	
C461		ECCF1H121JC	C.CAPACITOR 50V 120P	1	
C462		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C463		ECCF1H020CC	C.CAPACITOR 50V 2P	1	
C464		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C466,67		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C468		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C469		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C470		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C471,72		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C474		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C476		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C477		ECCF1H020CC	C.CAPACITOR 50V 2P	1	
C478,79		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C480		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C481,82		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C483		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C484		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C485		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C486		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C487		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C488		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C489		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C490		ECQP1H271JZ	P.CAPACITOR 50V 270P	1	
C491		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C492		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C493		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C494		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C500		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C501-04		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C507		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C508		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C509		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C510		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C511		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C512		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C513,14		ECCF1H270JC	C.CAPACITOR 50V 27P	2	
C515-19		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	5	
C520		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C600		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C601		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C602		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C603		ECCF1H270JC	C.CAPACITOR 50V 27P	1	
C604		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C605		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C606		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C607		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C608		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C609		ECCF1H270JC	C.CAPACITOR 50V 27P	1	
C610		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C611-13		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C614		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C615,16		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C618		ECCF1H820JC	C.CAPACITOR 50V 82P	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C619		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C620		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C621		ECCF1H020CC	C.CAPACITOR 50V 2P	1	
C622		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C623		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C624,25		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C626		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C627		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C628		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C629,30		ECCF1H050CC	C.CAPACITOR 50V 5P	2	
C631		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C632		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C633		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C634		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C635		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C636		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C637		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C638		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C639		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C640		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C641		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C642		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C643		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C644		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C645		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C646		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C647		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C648		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C649		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C650-52		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C653		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C654		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C655		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C656		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C658		ECCF1H020CC	C.CAPACITOR 50V 2P	1	
C659,60		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C661		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C662		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C663		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C664		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C666		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C667		ECCF1H020CC	C.CAPACITOR 50V 2P	1	
C668		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C669		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C670		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C671		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C672		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C673		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C674		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C675		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C676		ECCF1H120JC	C.CAPACITOR 50V 12P	1	
C677		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C678		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C679		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C680		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C681		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C682		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C683		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C684,85		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C686		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C687		ECEA1AU330	E.CAPACITOR 10V 33U	1	
C688		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C700-04		ECCF1H101JC	C.CAPACITOR 50V 100P	5	
C705		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C706,07		ECCF1H220JC	C.CAPACITOR 50V 22P	2	
C708		ECCF1H180JC	C.CAPACITOR 50V 18P	1	
C2001		ECQP1H221JZ	P.CAPACITOR 50V 220P	1	
C2002,03		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C2004		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C2101,02		ECCF1H820JC	C.CAPACITOR 50V 82P	2	
C9001		ECEA0JK330	E.CAPACITOR 6.3V 33U	1	
D1		1SZ51	DIODE	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
D2-D5		MA165	DIODE	4	
D200-02		RD4.7EB2	ZENER 4.7V	3	
D203		MA165	DIODE	1	
D204-06		RD4.7EB2	ZENER 4.7V	3	
D207		MA165	DIODE	1	
D208,09		MA328R	DIODE	2	
D210		MA165	DIODE	1	
D401,02		MA165	DIODE	2	
D403		1SZ51	DIODE	1	
D406-09		MA1160	DIODE	4	
D410		MA165	DIODE	1	
D411		MA165	DIODE	1	OR 1SS119, 1SS254
D600,01		RD6.2EB2	ZENER 6.2V	2	
D602,03		MA1160	DIODE	2	
D604-07		MA165	DIODE	4	
D608-10		MA1160	DIODE	3	
DL200		ELB5G050	DELAY	1	
FL1		VLF0650	FILTER	1	
FL2		VLF0653	FILTER	1	
FL3		VLF0657	FILTER	1	
FL200		VLF0654	FILTER	1	
FL201,202		VLF0753	FILTER	2	
FL203,04		VLF0545	FILTER	2	
IC1		AN78N09	IC	1	
IC2		UPD4053BC	IC	1	
IC4		AN78N05	IC	1	
IC5		NJM4560DD	IC	1	
IC6		HA19211P	IC	1	
IC7		SN74LS374N	IC	1	
IC10		VCR0133	IC	1	
IC11		HA17082PS	IC	1	
IC12		UPC4558C	IC	1	
IC13		HA17082PS	IC	1	
IC14		UPC4558C	IC	1	
IC15		LM6364N	IC	1	
IC16		HA19211P	IC	1	
IC17		SN74LS374N	IC	1	
IC19		UPC4558C	IC	1	
IC20		HA17082PS	IC	1	
IC21		AN78L05	IC	1	
IC22,23		AN78N09	IC	2	
IC23		AN79N05	IC	1	
IC24		NJM4560DD	IC	1	
IC25		AN79N09	IC	1	
IC200		HD74LS374P	IC	1	
IC201		MB40778P	IC	1	
IC202		AN78L09	IC	1	
IC203		AN79L09	IC	1	
IC204		AN78N09	IC	1	
IC205		AN79N09	IC	1	
IC206		VCR0133	IC	1	
IC207		HA17082PS	IC	1	
IC208		UPC324C	IC	1	
IC209		HD74LS00P	IC	1	
IC210		F74F109PC	IC	1	
IC211		HD74LS374P	IC	1	
IC212		MB40778P	IC	1	
IC213		AN78N09	IC	1	
IC214		AN79N09	IC	1	
IC215		VCR0133	IC	1	
IC216		AN78L09	IC	1	
IC217		AN79L09	IC	1	
IC218,19		HA17082PS	IC	2	
IC220		UPC324C	IC	1	
IC221,22		MC1496P	IC	2	
IC223		VCR0133	IC	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC225		HD74LS374P	IC	1	
IC226		MB40778P	IC	1	
IC227		VCR0133	IC	1	
IC228		MC74HC04F	IC	1	
IC229,30		SN74LS74ANS	IC	2	
IC231		AN78M05	IC	1	
IC232		VCR0133	IC	1	
IC402		SN74LS221NS	IC	1	
IC404		SN74LS123NS	IC	1	
IC405		SN74LS08NS	IC	1	
IC406		AN78N09	IC	1	
IC407,08		AN6041	IC	2	
IC410		SN74LS74ANS	IC	1	
IC411		SN74LS08NS	IC	1	
IC412		SN74LS74ANS	IC	1	
IC413		SN74LS00NS	IC	1	
IC414		SN74LS74ANS	IC	1	
IC416		TL084CNS	IC	1	
IC417		MC74HC4052F	IC	1	
IC418		UPC4560G	IC	1	
IC420		SN74LS00NS	IC	1	
IC421		SN74LS74ANS	IC	1	
IC426		SN74LS123NS	IC	1	
IC429		MC74HC74F	IC	1	
IC430,31		MC74HC08F	IC	2	
IC432,33		MC74HC00F	IC	2	
IC434		TL082CP	IC	1	
IC435		NE5539N	IC	1	
IC436		AN78N09	IC	1	
IC437		NE5539N	IC	1	
IC439		UPC4560C	IC	1	
IC600,01		CA3054	IC	2	
IC602		HD75110P	IC	1	
IC603		AN78N09	IC	1	
IC604		NE5539N	IC	1	
IC606		SN74LS04NS	IC	1	
IC607		MC74HC08F	IC	1	
IC608		NJM4560DD	IC	1	
IC609		SN74LS221NS	IC	1	
IC610		MC1496P	IC	1	
IC611		SN74LS04NS	IC	1	
IC612		SN74LS08NS	IC	1	
IC613		SN74LS06N	IC	1	
IC614,15		NE5539N	IC	2	
IC616		MC74HC4053N	IC	1	
IC617		MC74HC4051N	IC	1	
IC901		SN74LS00NS	IC	1	
IC902		AN79N05	IC	1	
IC904		AN79N05	IC	1	
L1-L4		VLP0017	COIL	4	
L5,L6		VLQEL06F101K	COIL 100UH	2	
L8,L9		VLP0017	COIL	2	
L10-14		VLQEL05F470J	COIL 47UH	5	
L17,18		VLP0017	COIL	2	
L19,20		VLQEL05F470J	COIL 47UH	2	
L21		VLQEL06F821J	COIL 820UH	1	
L22,23		VLQEL06F101K	COIL 100UH	2	
L24,25		VLQEL05F470J	COIL 47UH	2	
L30		VLQEL06F470J	COIL 47UH	1	
L200-02		VLP0017	COIL	3	
L204		VLP0017	COIL	1	
L205-08		VLQEL06F470J	COIL 47UH	4	
L209		VLQEL06F150J	COIL 15UH	1	
L210		VLQEL06F5R6J	COIL 5.6UH	1	
L213,14		VLP0017	COIL	2	
L215,16		VLQEL06F470J	COIL 47UH	2	
L217		VLQEL06F390J	COIL 39UH	1	
L418-21		VLQEL06F470J	COIL 47UH	4	
L422		VLQEL06F101K	COIL 100UH	1	
L423-25		VLQEL06F470J	COIL 47UH	3	
L600-03		VLQEL06F470J	COIL 47UH	4	
L605-10		VLQEL06F470J	COIL 47UH	6	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
L611		VLQEL06F151K	COIL 18UH	1	
L612		VLQEL06F5R6J	COIL 56UH	1	
L613		VLQEL06F6R8J	COIL 6.8UH	1	
L614-19		VLQEL06F470J	COIL 47UH	6	
L621-23		VLQEL06F470J	COIL 47UH	3	
L701		VLQEL05F4R7J	COIL 4.7UH	1	
L2001		VLQEL06F6R8J	COIL 6.8UH	1	
Q1		2SD636	TRANSISTOR	1	
Q2		2SB641	TRANSISTOR	1	
Q3		2SD636	TRANSISTOR	1	
Q4		2SB641	TRANSISTOR	1	
Q5		2SD636	TRANSISTOR	1	
Q6		2SB641	TRANSISTOR	1	
Q7		2SD636	TRANSISTOR	1	
Q8		2SA781	TRANSISTOR	1	
Q9		2SK301	TRANSISTOR	1	
Q10		2SB641	TRANSISTOR	1	
Q11		2SK301	TRANSISTOR	1	
Q12		2SA781	TRANSISTOR	1	
Q13		2SD636	TRANSISTOR	1	
Q14		2SB641	TRANSISTOR	1	
Q15		2SD636	TRANSISTOR	1	
Q16,17		2SB641	TRANSISTOR	2	
Q18		2SK301	TRANSISTOR	1	
Q19		2SA781	TRANSISTOR	1	
Q20		2SD636	TRANSISTOR	1	
Q21		2SB641	TRANSISTOR	1	
Q23		2SD636	TRANSISTOR	1	
Q200,01		2SD636	TRANSISTOR	2	
Q202		2SB641	TRANSISTOR	1	
Q203,04		2SC2206	TRANSISTOR	2	
Q205		2SD636	TRANSISTOR	1	
Q208		2SD636	TRANSISTOR	1	
Q209		2SB641	TRANSISTOR	1	
Q210,11		2SC2188	TRANSISTOR	2	
Q212		2SK128	TRANSISTOR	1	
Q213		2SD636	TRANSISTOR	1	
Q214		2SB641	TRANSISTOR	1	
Q215,16		2SC2188	TRANSISTOR	2	
Q217		2SK128	TRANSISTOR	1	
Q219		2SD636	TRANSISTOR	1	
Q220		2SB641	TRANSISTOR	1	
Q221		2SC2206	TRANSISTOR	1	(B,C)
Q222		2SC2188	TRANSISTOR	1	
Q223		2SK128	TRANSISTOR	1	
Q224		2SB641	TRANSISTOR	1	
Q225,26		2SC2188	TRANSISTOR	2	
Q227		2SK128	TRANSISTOR	1	
Q228		2SA781	TRANSISTOR	1	
Q229-31		2SD636	TRANSISTOR	3	
Q232		2SA1254	TRANSISTOR	1	
Q233		2SC2206	TRANSISTOR	1	(B,C)
Q235		2SD636	TRANSISTOR	1	
Q236		2SB641	TRANSISTOR	1	
Q237		2SC2206	TRANSISTOR	1	(B,C)
Q238		2SC2188	TRANSISTOR	1	
Q239		2SK128	TRANSISTOR	1	
Q240		2SB641	TRANSISTOR	1	
Q241		2SA1254	TRANSISTOR	1	
Q241,42		2SC2188	TRANSISTOR	2	
Q243		2SK128	TRANSISTOR	1	
Q245		2SC2206	TRANSISTOR	1	(B,C)
Q246		DTC124EA	TRANSISTOR RESISTOR	1	
Q248		2SC828	TRANSISTOR	1	
Q249		2SB641	TRANSISTOR	1	
Q250		2SC828	TRANSISTOR	1	
Q251		2SB641	TRANSISTOR	1	
Q252		2SC828	TRANSISTOR	1	
Q253		2SB641	TRANSISTOR	1	
Q254,55		2SD636	TRANSISTOR	2	
Q257		2SC828	TRANSISTOR	1	
Q420,21		2SB641	TRANSISTOR	2	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
Q422-25		2SD636	TRANSISTOR	4	(R)
Q426,27		2SB641	TRANSISTOR	2	
Q428-31		2SD636	TRANSISTOR	4	(R)
Q432		2SB641	TRANSISTOR	1	
Q433-42		2SC2206	TRANSISTOR	10	
Q443		2SB641	TRANSISTOR	1	
Q600,01		2SD636	TRANSISTOR	2	
Q602		2SB641	TRANSISTOR	1	
Q603,04		2SD636	TRANSISTOR	2	(R)
Q605		2SB641	TRANSISTOR	1	
Q606,07		2SD636	TRANSISTOR	2	(R)
Q608		2SA781	TRANSISTOR	1	
Q609		2SD636	TRANSISTOR	1	
Q610		2SB641	TRANSISTOR	1	
Q611		2SD636	TRANSISTOR	1	
Q612,13		2SB641	TRANSISTOR	2	
Q614		2SC1047	TRANSISTOR	1	
Q615		2SD636	TRANSISTOR	1	
Q616,17		2SB641	TRANSISTOR	2	
Q618		2SD636	TRANSISTOR	1	
Q619		2SB641	TRANSISTOR	1	
Q620,21		2SD636	TRANSISTOR	2	(R)
Q622		2SB641	TRANSISTOR	1	
Q623,24		2SD636	TRANSISTOR	2	(R)
Q625		2SB641	TRANSISTOR	1	
Q626		2SD636	TRANSISTOR	1	(R)
Q627		2SB641	TRANSISTOR	1	
Q628-36		2SD636	TRANSISTOR	9	
Q638		DTC124EA	TRANSISTOR RESISTOR	1	
Q640		2SA1005	TRANSISTOR	1	
Q641,42		2SK128	TRANSISTOR	2	
Q643		2SB641	TRANSISTOR	1	
Q644,45		2SD636	TRANSISTOR	2	(R)
Q646		2SB641	TRANSISTOR	1	
Q649		DTC124EA	TRANSISTOR RESISTOR	1	
			RESISTORS		
R1		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R2,R3		ERDS2TJ220	C.RESISTOR 1/4W 22	2	
R4,R5		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	2	
R6,R7		EROS2CKF3000	M.RESISTOR 1/4W 300	2	
R8		EROS2CKF1470	M.RESISTOR 1/4W 147	1	
R9		EROS2CKF3010	M.RESISTOR 1/4W 301	1	
R10		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R11		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R12		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R13		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R16		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R18		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R19		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R20		EROS2CHF2702	M.RESISTOR 1/4W 27K	1	
R21		EROS2CHF2002	M.RESISTOR 1/4W 20K	1	
R22		EROS2CHF1502	M.RESISTOR 1/4W 15K	1	
R23		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R24		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R25		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R34		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R35		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R36		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R38		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R39		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R40		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R41		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R42		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R43,44		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	2	
R45		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R46		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R47		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R48		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R49		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R50		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R51		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R52		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R53		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R54		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R55		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R56		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R57		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R58		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R59		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R60		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R61		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R62		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R63		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R64		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R65		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R66		EROS2CHF1002	M.RESISTOR 1/4W 10K	1	
R67		EROS2CHF3901	M.RESISTOR 1/4W 3.9K	1	
R68		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R69		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R70		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R71		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R72,73		ERDS2TJ220	C.RESISTOR 1/4W 22	2	
R74,75		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	2	
R76,77		EROS2CKF3000	M.RESISTOR 1/4W 300	2	
R78		EROS2CKF1470	M.RESISTOR 1/4W 147	1	
R79		EROS2CKF3010	M.RESISTOR 1/4W 301	1	
R80		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R81		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R82		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R83		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R85		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R86		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R87		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R88		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R91		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R92		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R93		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R102		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R103		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R104		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R105		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R106		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R107		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R108,09		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	2	
R110		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R111		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R112		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R113		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R114		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R115		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R116		EROS2CHF1802	M.RESISTOR 1/4W 18K	1	
R117		EROS2CHF1202	M.RESISTOR 1/4W 12K	1	
R118		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R119		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R120		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R121		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R122		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R123		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R124		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R126		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R127-29		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	3	
R130		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R131		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R132		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R133		EROS2CKF3000	M.RESISTOR 1/4W 300	1	
R134		ERDS2TJ751	C.RESISTOR 1/4W 750	1	
R135		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R136		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R137,38		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R200		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R201		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R202		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R203		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R204		EROS2CKF2940	M.RESISTOR 1/4W 294	1	
R205		EROS2CKF3010	M.RESISTOR 1/4W 301	1	
R206,07		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R208,09		ERDS2TJ220	C.RESISTOR 1/4W 22	2	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R210		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R211		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R212-14		EROS2CKF2200	M.RESISTOR 1/4W 220	3	
R215		ERDS2TJ270	C.RESISTOR 1/4W 27	1	
R216		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R218,19		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R220		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R221		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R222		ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R223		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R229,30		ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R231		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R232		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R233,34		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	2	
R235		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R236		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R237,38		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	2	
R239,40		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R241,42		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R243		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R244		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R245,46		ERDS2TJ273	C.RESISTOR 1/4W 27K	2	
R247,48		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	2	
R249,50		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	2	
R251		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R252		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R253,54		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	2	
R255,56		ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R257		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R258,59		ERDS2TJ683	C.RESISTOR 1/4W 68K	2	
R260		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R261		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R263		EROS2CKF2200	M.RESISTOR 1/4W 220	1	
R265		EROS2CKF3010	M.RESISTOR 1/4W 301	1	
R266		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R267		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R268		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R269,70		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	2	
R271		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R272		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R273		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R274		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R275		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R276		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R277		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R278		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R279		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R280		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R281		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R282		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R283		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R284		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R285		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R286		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R287		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R288		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R289		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R290		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R291		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R292		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R293		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R294		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R295,96		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R297		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R298		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R299		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R300		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R301		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R302		ERTD2FHL102S	THERMISTOR 1K	1	
R303		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R304		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R305		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R306		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R307		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R308		EROS2CKF3000	M.RESISTOR 1/4W 300	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R309		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R310		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R311		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R312		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R313,14		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R315		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R317		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R318		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R320		EROS2CKF2200	M.RESISTOR 1/4W 220	1	
R322		EROS2CKF3010	M.RESISTOR 1/4W 301	1	
R323		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R324		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R325,26		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	2	
R327		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R328		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R329		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R330		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R331		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R332		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R333		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R334		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R335		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R336		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R337		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R338		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R339		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R340		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R341		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R342		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R343		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R344		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R345		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R346		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R347		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R348		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R349		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R350		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R351		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R352,53		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R354		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R355		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R356		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R357		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R358		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R359		ERTD2FHL102S	THERMISTOR 1K	1	
R360		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R361		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R363		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R364		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R365		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R366		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R367		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R368		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R369		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R370		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R371		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R372		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R373		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R374		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R375,76		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R377,78		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R379		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R382-85		ERDS2TJ102	C.RESISTOR 1/4W 1K	4	
R386		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R387		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R388		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R389		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R393		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R394		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R395		ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R396		ERTD2FHL102S	THERMISTOR 1K	1	
R397		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R398		ERDS2TJ154	C.RESISTOR 1/4W 150K	1	
R399		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R418		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R419		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R420-22		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R427,28		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R434		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R435		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R436		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R437		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R438		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R439		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R440		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R441		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R442		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R444		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R455		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R456		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R457		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R470		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R471		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R472		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R473		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R474		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R475		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R488,89		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R490		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R491		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R492		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R493		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R494		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R495		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R499		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R501		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R502		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R503		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R504		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R505		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R506		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R507		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R508,09		ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R510		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R511		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R512		ERDS2TJ750	C.RESISTOR 1/4W 75	1	
R513		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R514		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R515		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R516		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R517		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R518		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R519		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R520		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R521		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R522		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R523		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R526		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R527		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R528		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R529		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R530		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R531		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R534		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R535		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R536		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R537		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R538		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R539		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R540		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R541		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R542		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R543		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
R545		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R546		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
R548		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R549		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
R550		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R552,53		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R554		ERDS2TJ750	C.RESISTOR 1/4W 75	1	
R555		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
R556		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R557		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
R558		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R560		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R561		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
R562		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R563		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
R565		ERDS2TJ750	C.RESISTOR 1/4W 75	1	
R567		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R568		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R569,70		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R571		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R572		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R600		ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R601,02		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R603		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R604,05		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R606		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R607		ERDS2TJ121	C.RESISTOR 1/4W 120	1	
R608		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R609		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R610		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R611		ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R612,13		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R614		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R615,16		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R617		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R618		ERDS2TJ121	C.RESISTOR 1/4W 120	1	
R619		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R620		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R621		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R622		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R623,24		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R625,26		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R627,28		ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R629,30		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R631,32		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R633,34		ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R635		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R636		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R637		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R638		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R639		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R640		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R641		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R642		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R643		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R644		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R645		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R646		ERDS2TJ750	C.RESISTOR 1/4W 75	1	
R647		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R648		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R649		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R650		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R651		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R652		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R653,54		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R655		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R656		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R657		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R658		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R659		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R660		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R661		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R662		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R663		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R664		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R665		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R666		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R667		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R668,69		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	2	
R670		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R671		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R672		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R673		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R674		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R675		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R676,77		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	2	
R678		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R679		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R680		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R681,82		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R683		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R684		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R685		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R686		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R687		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R688		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R689		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R690		ERTD2FHL102S	THERMISTOR 1K	1	
R691		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R692		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R693,94		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R695		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R696		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R697		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R698		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R699		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R700		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R701		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R702		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R703,04		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R705		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R706		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R707		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R708		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R709,10		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R711		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R712		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R713		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R714		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R715		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R716,17		ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R718		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R719		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R720		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R721		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R722,23		ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R724		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R727,28		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R729		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R730		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R731		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R732		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R733		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R734		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R735		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R736		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R737		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R738		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R739		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R740		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R741		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R742		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R743		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R744		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R746		ERDS2T0	C.RESISTOR 1/4W 0	1	
R747		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R748		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R749		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R750		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R751		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R752		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R753		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R754		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R755		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R756		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R757		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R758		ERDS2TJ101	C.RESISTOR 1/4W 100	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R759		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R760		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R761		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R762		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R763		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R764		EROS2CHD73R2	M.RESISTOR 1/4W 73.2	1	
R765-73		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	9	
R774-77		ERDS2TJ101	C.RESISTOR 1/4W 100	4	
R778,79		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	2	
R780		ERDS2TJ750	C.RESISTOR 1/4W 75	1	
R781,82		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R783		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R784		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R785		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R787		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R788		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R789		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R790		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R791,92		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R793		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R794		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R795,96		ERDS2TJ561	C.RESISTOR 1/4W 560	2	
R797		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R801		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R4000		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R4001		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R4002		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R4003		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R4004		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R4005		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R4006		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R4007		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R4008		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R4009		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R4010		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R4011		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R4012		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R4014		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R4016		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R4017		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R4018		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R4019		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R4020		ERDS2TJ154	C.RESISTOR 1/4W 150K	1	
R4025		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R4029		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R4030		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R4032		EROS2CKF3000	M.RESISTOR 1/4W 300	1	
R4033		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R4035		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R4036		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R4037		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R4038		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R4039,40		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R9100		ERDS2T0	C.RESISTOR 1/4W 0	1	
RA200-02		EXBR88332J	RESISTOR & RESISTOR 3.3K	3	
SW202		VJS1563	CONNECTOR(FEMALE)	1	
SW203,04		VJS1990	CONNECTOR	2	
SW403		VJS1563	CONNECTOR(FEMALE)	1	
SW404		VST0061	SWITCH	1	
SW2021,22		VJP1563	CONNECTOR(MALE)	2	
SW2031		VJP1990	CONNECTOR	1	
SW2041		VJP1990	CONNECTOR	1	
SW4001,02		VJP1563	CONNECTOR(MALE)	2	
SW4011,12		VJP1563	CONNECTOR(MALE)	2	
SW4031,32		VJP1563	CONNECTOR(MALE)	2	
SW400S		VJS1563	CONNECTOR(FEMALE)	1	
SW401S		VJS1563	CONNECTOR(FEMALE)	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
TP1,P2		VJR0400Y	TEST POINT	2	
TP4-P6		VJR0400Y	TEST POINT	3	
TP200-05		VJR0400Y	TEST POINT	6	
TP400,01		VJR0400Y	TEST POINT	2	
TP403-06		VJR0400Y	TEST POINT	4	
TP600-05		VJR0400Y	TEST POINT	6	
TPG1,G2		VJR0400B	TEST POINT	2	
TPG200,01		VJR0400B	TEST POINT	2	
TPG400		VJR0400B	TEST POINT	1	
TPG402		VJR0400B	TEST POINT	1	
TPG600		VJR0400B	TEST POINT	1	
VR2		VRV0063B502	V.RESISTOR 5K	1	
VR3		VRV0063B501	V.RESISTOR 500	1	
VR4,R5		VRV0063B202	V.RESISTOR 2K	2	
VR6		VRV0063B501	V.RESISTOR 500	1	
VR7		VRV0063B503	V.RESISTOR 50K	1	
VR200		VRV0063B203	V.RESISTOR 20K	1	
VR201		VRV0063B202	V.RESISTOR 2K	1	
VR204		VRV0063B103	V.RESISTOR 10K	1	
VR205-07		VRV0063B501	V.RESISTOR 500	3	
VR208		VRV0064B503	V.RESISTOR 50K	1	
VR209		VRV0063B103	V.RESISTOR 10K	1	
VR210,11		VRV0063B102	V.RESISTOR 1K	2	
VR212,13		VRV0063B501	V.RESISTOR 500	2	
VR214		VRV0063B103	V.RESISTOR 10K	1	
VR215		VRV0064B503	V.RESISTOR 50K	1	
VR216		VRV0063B103	V.RESISTOR 10K	1	
VR301,02		VRV0063B102	V.RESISTOR 1K	2	
VR402		VRV0063B501	V.RESISTOR 500	1	
VR403,04		VRV0063B103	V.RESISTOR 10K	2	
VR405		VRV0063B102	V.RESISTOR 1K	1	
VR600		VRV0063B203	V.RESISTOR 20K	1	
VR601		VRV0063B502	V.RESISTOR 5K	1	
VR602		VRV0063B503	V.RESISTOR 50K	1	
VR603,04		VRV0063B102	V.RESISTOR 1K	2	
VR605		VRV0063B202	V.RESISTOR 2K	1	
VR606,07		VRV0063B102	V.RESISTOR 1K	2	
VR608		VRV0063B103	V.RESISTOR 10K	1	
VR609-12		VRV0063B501	V.RESISTOR 500	4	
VR613,14		VRV0063B103	V.RESISTOR 10K	2	
			MISCELLANEOUS		
		VJR0419	PIN	7	
		VJS1435	20P SOCKET	3	
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
	■	VEP88041A	P.C.BOARD W/COMPONENT		PART OF VEP88040A
			VISC SUB		
			CAPACITORS		
C400		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C401		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C402		ECQM1H122JV	P.CAPACITOR 50V 1200P	1	
C403		ECUX1H151JCN	CHIP 50V 150P	1	
C404,05		ECQM1H122JV	P.CAPACITOR 50V 1200P	2	
C406		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C407		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C408		ECUX1H220JCN	CHIP 50V 22P	1	
C409		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C410		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C411		ECUX1H151JCN	CHIP 50V 150P	1	
C412		ECUX1H101JCN	CHIP 50V 100P	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C422,23		ECUX1H471KBN	CHIP 50V 470P	2	
C424,25		ECEA1HKSR47	E.CAPACITOR 50V 0.47U	2	
C429		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C430		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C431		ECUX1E104ZFN	CHIP 25V 0.1U	1	
C434		ECEA1HKSR47	E.CAPACITOR 50V 0.47U	1	
C436		ECUX1H471KBN	CHIP 50V 470P	1	
C437-39		ECEA1HKSR47	E.CAPACITOR 50V 0.47U	3	
C442		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C443		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C454		ECEA1HKSR47	E.CAPACITOR 50V 0.47U	1	
C455		ECUX1H102KBN	CHIP 50V 1000P	1	
C457		ECEA1EKS4R7	E.CAPACITOR 25V 4.7U	1	
C458		ECEA0JKS330	E.CAPACITOR 6.3V 33U	1	
C495		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C496		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C497		ECEA1CSN100	E.CAPACITOR 16V 10U	1	
C498		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C499		ECEA1CKS470	E.CAPACITOR 16V 47U	1	
C505		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C506		ECEA0JKS470	E.CAPACITOR 6.3V 47U	1	
C507		ECUX1H103ZFN	CHIP 50V 0.01U	1	
C508		ECEA0JKS470	E.CAPACITOR 6.3V 47U	1	
D400		MA704	DIODE	1	
D404,05		MA151K	DIODE	2	
IC400		TL810CPS	IC	1	
IC401		MC74HC4053F	IC	1	
IC409		UPC319G	IC	1	
IC415		MC74HC4053F	IC	1	
IC419		MC74HC4053F	IC	1	
IC422		UPC4082G	IC	1	
IC423		TL084CNS	IC	1	
IC424,25		MC74HC4053F	IC	2	
IC441		MC74HC4053F	IC	1	
IC442		UPC319G	IC	1	
L400-02		VLQEL05F470J	COIL 47UH	3	
L403		VLQEL05F560J	COIL 56UH	1	
L405,06		VLQEL05F391K	COIL 390UH	2	
L407,08		VLQEL05F470J	COIL 47UH	2	
L409		VLQEL05F391K	COIL 390UH	1	
L411-14		VLQEL05F470J	COIL 47UH	4	
L426		VLQEL05F8R2K	COIL 8.2UH	1	
P1-P3		VJR0273	CONNECTOR	3	
Q400		2SC2295	TRANSISTOR CHIP	1	(B,C)
Q401		2SD601	TRANSISTOR CHIP	1	(Q)
Q402		2SB709S	TRANSISTOR	1	
Q403,04		2SD601	TRANSISTOR CHIP	2	(Q)
Q405		2SC2295	TRANSISTOR CHIP	1	(B,C)
Q406		2SB709S	TRANSISTOR	1	
Q407-09		2SD601	TRANSISTOR CHIP	3	(Q)
Q411-16		2SD601	TRANSISTOR CHIP	6	(Q)
			RESISTORS		
R400		ERJ6GEYJ393	CHIP 1/16W 39K	1	
R401		ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R402		ERJ6GEYJ331	CHIP 1/16W 330	1	
R403,04		ERJ6GEYJ682	CHIP 1/16W 6.8K	2	
R405		ERJ6GEYJ272	CHIP 1/16W 2.7K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R406		ERJ6GEYJ821	CHIP 1/16W 820	1	
R407		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R408		ERJ6GEYJ122	CHIP 1/16W 1.2K	1	
R409,10		ERJ6GEYJ561	CHIP 1/16W 560	2	
R411		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R412		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R413		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R414		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R415		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R416		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R417		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R423,24		ERJ6GEYJ332	CHIP 1/16W 3.3K	2	
R425,26		ERJ6GEYJ152	CHIP 1/16W 1.5K	2	
R429		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R430		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R445,46		ERJ6GEYJ122	CHIP 1/16W 1.2K	2	
R447		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R448,49		ERJ6GEYJ122	CHIP 1/16W 1.2K	2	
R450,51		ERJ6GEYJ392	CHIP 1/16W 3.9K	2	
R452,53		ERJ6GEYJ102	CHIP 1/16W 1K	2	
R454		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R476,77		ERJ6GEYJ562	CHIP 1/16W 5.6K	2	
R478		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R479		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R480		ERJ6GEYJ273	CHIP 1/16W 27K	1	
R481		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R482		ERJ6GEYJ273	CHIP 1/16W 27K	1	
R483-85		ERJ6GEYJ103	CHIP 1/16W 10K	3	
R486		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R487		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R566		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
SW402		VJS1563	CONNECTOR(FEMALE)	1	
SW4021		VJP1563	CONNECTOR(MALE)	1	
TP402		VJR0400Y	TEST POINT	1	
TPG401		VJR0400B	TEST POINT	1	
VR400,01		VRV0063B202	V.RESISTOR 2K	2	
VR406,07		VRV0063B102	V.RESISTOR 1K	2	
	■	VEP80211A	P.C.BOARD W/COMPONENT		PART OF VEP88040A
			ENCODER SUB		
			CAPACITORS		
C1001		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C1002,03		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C1004		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C1005		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C1006		ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C1007-09		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
D1001,02		MA165	DIODE	2	OR 1SS119, 1SS254
IC1001		MC10116L	IC	1	
IC1002		MC10158L	IC	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
L1001		VLQEL06F101J	COIL 100UH	1	
			RESISTORS		
R1001		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R1002		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R1003		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R1004		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R1005		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R1006,07		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R1008		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R1009		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R1010		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R1011		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R1012		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R1013,14		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R1015-18		ERDS2TJ681	C.RESISTOR 1/4W 680	4	
R1019		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R1020		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R1021,22		ERDS2TJ681	C.RESISTOR 1/4W 680	2	
			MISCELLANEOUS		
		VJR0421	PIN	4	
	■	VEP80212A	P.C.BOARD W/COMPONENT		PART OF VEP88040A
			SEARCH SUB		
			CAPACITORS		
C7011		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C7041		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C7142		ECCF1H040DC	C.CAPACITOR 50V 4P	1	
IC7003		LM6364N	IC	1	
			RESISTORS		
R7015		ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R7017		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
TP7003		VJR0400Y	PIN	1	
VR7001		VRV0063B202	V.RESISTOR 2K	1	
			MISCELLANEOUS		
		VJR0422	PIN	6	
	■	VEP80424A	P.C.BOARD W/COMPONENT		PART OF VEP88040A
			LPF SELECT SW		
			RESISTORS		
R551		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R559		EROS2CKF3300	M.RESISTOR 1/4W 330	1	
SW101		VST0061	SWITCH	1	
			MISCELLANEOUS		
		VJR0422	PIN	4	

To guarantee the FUNCTION, SAFETY and RELIABLITY of repaired units, only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP82046G L5 SERVO & REEL

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP82046G	P.C.BOARD W/COMPONENT		
L5			SERVO & REEL		
			CAPACITORS		
C1		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C2		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C3		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C4		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C5		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C6		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C7		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C8		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C9		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C10		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C11		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C12		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C13		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C14		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C15		ECQM1H273JZ	P.CAPACITOR 50V 0.027U	1	
C16		ECEA50ZR22	E.CAPACITOR 50V 0.22U	1	
C17		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C18		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C19		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C20		ECQM1H273JZ	P.CAPACITOR 50V 0.027U	1	
C21		ECEA50ZR22	E.CAPACITOR 50V 0.22U	1	
C22		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C23		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C24		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C25		ECKF1H561KB	C.CAPACITOR 50V 560P	1	
C26		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C27		ECEA1EU101	E.CAPACITOR 25V 100U	1	
C29		ECQM1H822JV	P.CAPACITOR 50V 8200P	1	
C30		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C31		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C32		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C33,34		ECQM1H563JV	P.CAPACITOR 50V 0.056U	2	
C35		ECQV1H334JZ	P.CAPACITOR 50V 0.33U	1	
C36		ECKF1H331KB	C.CAPACITOR 50V 330P	1	
C37		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C38		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C39		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C40		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C41		ECEA1HK010	E.CAPACITOR 50V 1U	1	
C42		ECQM1H154JF	P.CAPACITOR 50V 0.15U	1	
C43		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C44		ECQV1H184JZ	P.CAPACITOR 50V 0.18U	1	
C45		ECQB1H153JZ	P.CAPACITOR 50V 0.015U	1	
C46		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C47		ECQB1H153JZ	P.CAPACITOR 50V 0.015U	1	
C50		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C51		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
C52		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C53		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C54		ECQM1H562JV	P.CAPACITOR 50V 5600P	1	
C55		ECQM1H104JV	P.CAPACITOR 50V 0.1U	1	
C56		ECQM1H393JV	P.CAPACITOR 50V 0.039U	1	
C57		ECEA10Z22	E.CAPACITOR 10V 22U	1	
C58		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C59		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C60		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C61		ECEA1EN100S	E.CAPACITOR 25V 10U	1	
C62-66		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C67		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C68-70		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C72-85		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	14	
C86		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C87		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C88		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C89		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C90		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C91		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C92		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C93		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C94		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C95		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C96		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C97		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C98		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C99		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C100		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C101		ECQV1H824JZ	P.CAPACITOR 50V 0.82U	1	
C102		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C103		ECQV1H154JZ	P.CAPACITOR 50V 0.15U	1	
C104		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C105		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C106		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C107		ECKF1H681KB	C.CAPACITOR 50V 680P	1	
C108		ECQM1H472JV	P.CAPACITOR 50V 4700P	1	
C109		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C110		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C111		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C112		ECCF1H680JC	C.CAPACITOR 50V 68P	1	
C113		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C114		ECQV1H564JZ	P.CAPACITOR 50V 0.56U	1	
C116		ECQM1H153JV	P.CAPACITOR 50V 0.015U	1	
C117		ECQP1822JZ	P.CAPACITOR 100V 8200P	1	
C118		ECQM1H682JV	P.CAPACITOR 50V 6800P	1	
C123,24		ECEA1EU470	E.CAPACITOR 25V 47U	2	
C125		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C126		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C127		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C128		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C129		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C130		ECEA16Z47	E.CAPACITOR 16V 47U	1	
C131		ECQV1H224JZ	P.CAPACITOR 50V 0.22U	1	
C132		ECQM1H683JF	P.CAPACITOR 50V 0.068U	1	
C133		ECQV1H564JZ	P.CAPACITOR 50V 0.56U	1	
C134		ECQM1H124JF	P.CAPACITOR 50V 0.12U	1	
C135		ECQM1H472JV	P.CAPACITOR 50V 4700P	1	
C136		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C137		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C138		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C139		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C140,41		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C142		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C143,44		ECQM1H822JV	P.CAPACITOR 50V 8200P	2	
C145		ECQM1H394JV	P.CAPACITOR 50V 0.39U	1	
C148		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C162-87		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	26	
C189-93		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C194		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C195		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C197		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C198		ECKF1H561KB	C.CAPACITOR 50V 560P	1	
C199		ECKF1H331KB	C.CAPACITOR 50V 330P	1	
C200		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C201-03		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C205		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C207		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C209,10		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	2	
C211		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C212		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C213		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C214		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C215		ECEA0JU221	E.CAPACITOR 6.3V 220U	1	
C216		ECEA0JU102	E.CAPACITOR 6.3V 1000U	1	
C217		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C218		ECQM1H104JV	P.CAPACITOR 50V 0.1U	1	
C219		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C220		ECQM1H682JV	P.CAPACITOR 50V 6800P	1	
C221,22		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C223		ECEA1HN4R7S	E.CAPACITOR 50V 4.7U	1	
C224		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C225		ECQM1H104JV	P.CAPACITOR 50V 0.1U	1	
C226		ECQM1H682JV	P.CAPACITOR 50V 6800P	1	
C227		ECEA1HN4R7S	E.CAPACITOR 50V 4.7U	1	
C228-32		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C233		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C234		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C235		ECQM1H562JV	P.CAPACITOR 50V 5600P	1	
C236		ECQM1H392JV	P.CAPACITOR 50V 3900P	1	
C237,38		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C239		ECQM1H123JV	P.CAPACITOR 50V 0.012U	1	
C240		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C241,42		ECQM1H104JV	P.CAPACITOR 50V 0.1U	2	
C243,44		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C247-51		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C252		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C253		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C254		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C255		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C256		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C257		ECEA1CN470S	E.CAPACITOR 16V 47U	1	
C261		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C269,70		ECEA1CKS100	E.CAPACITOR 16V 10U	2	
C310		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C311		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C351		ECCF1H680JC	C.CAPACITOR 50V 68P	1	
C352		ECCF1H050DC	C.CAPACITOR 50V 5P	1	
C353-55		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C400		ECQM1H333JV	P.CAPACITOR 50V 0.033U	1	
C401		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C402		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C403		ECQM1H124JV	P.CAPACITOR 50V 0.12U	1	
C404		ECQM1H154JV	P.CAPACITOR 50V 0.15U	1	
C405		ECQM1H184JV	P.CAPACITOR 50V 0.18U	1	
C406,07		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	2	
C408		ECEA1CU330	E.CAPACITOR 16V 33U	1	
C409		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C410		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C577		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C580		ECQM1H473JF	P.CAPACITOR 50V 0.047U	1	
C585,86		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C587		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C588		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C589		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C590		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C591,92		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C593		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C594,95		ECQM1H333JV	P.CAPACITOR 50V 0.033U	2	
C596		ECEA1CN220S	E.CAPACITOR 16V 22U	1	
C597		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C598		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C599		ECQP1H331JZ	P.CAPACITOR 50V 330P	1	
C600		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C601		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C602		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C603		ECKF1H102ZF	C.CAPACITOR 50V 1000P	1	
C604		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C605		ECKF1H471KB	C.CAPACITOR 50V 470P	1	
C606		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C607-09		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C610		ECQB1H103JZ	P.CAPACITOR 50V 0.01U	1	
C611		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C612		ECCF1H221JC	C.CAPACITOR 50V 220P	1	
C613,14		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C641		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C700		ECQM1H333JF	P.CAPACITOR 50V 0.033U	1	
C701		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
D1,D2		MA165	DIODE	2	
D5-D9		MA165	DIODE	5	
D10-31		MA165	DIODE	22	
D32		RD4.7JB3	ZENER 4.7V	1	
D33		RD6.2EB2	ZENER 6.2V	1	
D34		MA165	DIODE	1	
D35		RD4.7JB3	ZENER 4.7V	1	
D43-45		MA165	DIODE	3	
D46		RD2.7EB2	ZENER 2.7V	1	
D47		RD2.0EB2	ZENER 2V	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
D48-52		MA165	DIODE	5	
D55-60		MA165	DIODE	6	
D61,62		LN25RP	LED	2	
D76		MA165	DIODE	1	
D80-82		MA165	DIODE	3	
D86-88		MA165	DIODE	3	
D89		MA4100L	DIODE	1	
D90		MA165	DIODE	1	
D101,02		MA165	DIODE	2	
IC1		NJM2903M	IC	1	
IC2		MC14013BF	IC	1	
IC3		MN4030BS	IC	1	
IC5		MN4027BS	IC	1	
IC6		MC14051BF	IC	1	
IC7		MC14538BF	IC	1	
IC11		MC14049UBF	IC	1	
IC12		UPC4558G	IC	1	
IC13		NJM2904M	IC	1	
IC14		MC14053BF	IC	1	
IC15		MC14049UBF	IC	1	
IC16		MC14053BF	IC	1	
IC17		MC14538BF	IC	1	
IC18		MC14013BF	IC	1	
IC19		MN4050BS	IC	1	
IC20,21		MC14094BF	IC	2	
IC22		MC14011BF	IC	1	
IC23		MC14073BF	IC	1	
IC24		NJM2904M	IC	1	
IC26		MC14049UBF	IC	1	
IC29		NJM2904M	IC	1	
IC30		MC14538BF	IC	1	
IC31		MC14011BF	IC	1	
IC32,33		MC14538BF	IC	2	
IC34		MC14011BF	IC	1	
IC37		MC14053BF	IC	1	
IC38		MN6064R	IC	1	
IC39		NJM2904M	IC	1	
IC40		MN6168VIA	IC	1	
IC41-43		NJM2904M	IC	3	
IC44		NJM2903M	IC	1	
IC45-48		MC14066BF	IC	4	
IC49		MC74HC00F	IC	1	
IC51		MC14052BF	IC	1	
IC52		AN78L09	IC	1	
IC53		NJM2903M	IC	1	
IC54		MC14049UBF	IC	1	
IC55		MC74HC74F	IC	1	
IC56		MC74HC02F	IC	1	
IC57		MC74HC74F	IC	1	
IC58		MC74HCU04F	IC	1	
IC59		DN74LS293S	IC	1	
IC60		MN4040BS	IC	1	<R>
IC61		MN4516BS	IC	1	
IC62		MN74HC32S	IC	1	
IC63		MC74HC00F	IC	1	
IC64-66		TC74HC191F	IC	3	
IC67		MC74HC20F	IC	1	
IC69,70		MN74HC174S	IC	2	
IC71		MC14538BF	IC	1	
IC72		MC74HCU04F	IC	1	
IC73		MN74HC266S	IC	1	
IC74		MN74HC14S	IC	1	
IC77		MC74HC74F	IC	1	
IC78		MN74HC221S	IC	1	
IC79		MC74HC08F	IC	1	
IC84		MN74HC21S	IC	1	
IC86-88		TC74HC191F	IC	3	
IC89,90		MN74HC174S	IC	2	
IC91,92		DAC1222LCN	IC	2	
IC93-96		NJM2904M	IC	4	
IC97		MC14066BF	IC	1	
IC98,99		MC14538BF	IC	2	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC100,01		MC14013BF	IC	2	
IC102		MC14071BF	IC	1	
IC103		AN6346N	IC	1	
IC123		MC14053BF	IC	1	
IC138		AN78L09	IC	1	
IC140		AN78L05	IC	1	
IC141,42		MC14094BF	IC	2	
IC143		MC14049UBF	IC	1	
IC144		MN4532BS	IC	1	
IC145		MC14071BF	IC	1	
IC146		MN4081BS	IC	1	
IC147		MC14013BF	IC	1	
IC148		MN4081BS	IC	1	
IC149		MC14053BF	IC	1	
IC150		MN4030BS	IC	1	
IC151		MC14538BF	IC	1	
IC152		MC14584BF	IC	1	
IC153		MC14053BF	IC	1	
IC154		MC14052BF	IC	1	
IC155-58		NJM2904M	IC	4	
IC159		MC14066BF	IC	1	
IC160		DN74LS17-1S	IC	1	
IC161		MC14053BF	IC	1	
IC162		MC14066BF	IC	1	
IC163		MC14053BF	IC	1	
IC165		NJM2901M	IC	1	
IC166		NJM2904M	IC	1	
IC168		MC14066BF	IC	1	
IC169		MN6168VIA	IC	1	
IC170,71		MC14051BF	IC	2	
IC172-74		NJM2904M	IC	3	
IC175		AN78L05	IC	1	
IC176		MN4001BS	IC	1	
IC177		MN4081BS	IC	1	
IC178		MN4030BS	IC	1	
IC180		MC14013BF	IC	1	
IC182		NJM2903M	IC	1	
IC190		MC14066BF	IC	1	
IC191		DN74LS17-1S	IC	1	
IC192		MC14053BF	IC	1	
IC193		MC14538BF	IC	1	
IC194		MC14013BF	IC	1	
IC195		NJM2904M	IC	1	
IC207		MN4050BS	IC	1	
IC208,09		MC14094BF	IC	2	
IC210,11		MC74HC08F	IC	2	
IC212		MC74HC02F	IC	1	
IC213		MN51030VZR	IC	1	
IC214		MN4030BS	IC	1	
IC215		MC14013BF	IC	1	
IC216		MC14049UBF	IC	1	
IC226		MC74HC04F	IC	1	
IC227		MN4081BS	IC	1	
IC228		MC14071BF	IC	1	
IC229		MN4081BS	IC	1	
IC230,31		MC14049UBF	IC	2	
IC234		MN4030BS	IC	1	
IC236		MC14011BF	IC	1	
IC237		MC14538BF	IC	1	
IC238		MC14073BF	IC	1	
IC242		MC14538BF	IC	1	
IC244		MC14013BF	IC	1	
IC245		MC14538BF	IC	1	
IC246		MC14013BF	IC	1	
IC249		MN4040BS	IC	1	<R>
IC250,51		MC14013BF	IC	2	
IC252		MC14538BF	IC	1	
IC255		MC74HCU04F	IC	1	
IC256		DN74LS293S	IC	1	
IC260		TL072CP	IC	1	
IC261		AN360	IC	1	
IC262		UPC4558G	IC	1	
IC263		MC14013BF	IC	1	
IC264		MC14001BF	IC	1	
IC265		MC14081BF	IC	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC266		MC74HC157F	IC	1	
IC267		MC14538BF	IC	1	
IC270		MN4050BS	IC	1	
IC301		MC14538BF	IC	1	
IC302		MC14013BF	IC	1	
IC303		MC14053BF	IC	1	
L1-L3		VLP0017	COIL	3	
L5-L7		VLP0017	COIL	3	
L8,L9		VLQEL06F221K	COIL 220UH	2	
L10,11		VLQEL06F221K	COIL 220UH	2	
L12		VLP0017	COIL	1	
L20,21		VLP0017	COIL	2	
L22,23		VLQEL06F151J	COIL 150UH	2	
Q3		2SD636	TRANSISTOR	1	
Q6-Q9		UN1213	TRANSISTOR-RESISTOR	4	
Q10		2SJ43	TRANSISTOR	1	
Q11-20		UN1213	TRANSISTOR-RESISTOR	10	
Q22		2SD636	TRANSISTOR	1	
Q23-25		UN1213	TRANSISTOR-RESISTOR	3	
Q26		2SB641	TRANSISTOR	1	
Q27-32		UN1213	TRANSISTOR-RESISTOR	6	
Q33		2SD636	TRANSISTOR	1	
Q34		2SK128	TRANSISTOR	1	
Q35		2SC2206	TRANSISTOR	1	
Q36		2SK128	TRANSISTOR	1	
Q37-39		UN1213	TRANSISTOR-RESISTOR	3	
Q40		UN1113	TRANSISTOR-RESISTOR	1	
Q41,42		UN1213	TRANSISTOR-RESISTOR	2	
Q49-54		UN1213	TRANSISTOR-RESISTOR	6	
Q56		UN1213	TRANSISTOR-RESISTOR	1	
Q60,61		UN1213	TRANSISTOR-RESISTOR	2	
Q63-86		UN1213	TRANSISTOR-RESISTOR	24	
Q87		2SD636	TRANSISTOR	1	
Q88-91		UN1213	TRANSISTOR-RESISTOR	4	
Q101,02		UN1213	TRANSISTOR-RESISTOR	2	
Q143,44		UN1213	TRANSISTOR-RESISTOR	2	
Q154		UN1213	TRANSISTOR-RESISTOR	1	
Q156		UN1213	TRANSISTOR-RESISTOR	1	
Q160		UN1213	TRANSISTOR-RESISTOR	1	
Q161,62		2SD636	TRANSISTOR	2	
Q163		UN1214	TRANSISTOR-RESISTOR	1	
Q164		UN1213	TRANSISTOR-RESISTOR	1	
			RESISTORS		
R1		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R2		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R3		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R4		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R5		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R6		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R7		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R8		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R9		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R10		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R11		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R12		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R13		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R14		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R15		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	1	
R17		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R18		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R24		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R25		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R26		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R27-29		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R30		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R31		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R32		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R33		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R34		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	1	
R35		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R36,37		ERDS2TJ563	C.RESISTOR 1/4W 56K	2	
R38,39		ERDS2TJ224	C.RESISTOR 1/4W 220K	2	
R40		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R41		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R42		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R44		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R45		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R46		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R47		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R48		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R49		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R50		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R51		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R52		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R53		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R54		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R55		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R56		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R57		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R58		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R59		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R60		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R61		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R62		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R63		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R64		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R65		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	1	
R66		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R67		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R68		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R69		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R70,71		ERDS2TJ563	C.RESISTOR 1/4W 56K	2	
R73		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R74,75		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R76-81		ERDS2TJ563	C.RESISTOR 1/4W 56K	6	
R83		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R84		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R85		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R87		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R88		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R89,90		ERDS2TJ563	C.RESISTOR 1/4W 56K	2	
R91		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R92		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R93		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R94		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R95		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R96		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R97		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R98,99		ERDS2TJ273	C.RESISTOR 1/4W 27K	2	
R100		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R101		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R102		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R103		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R104		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R105		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R106		ERDS2TJ824	C.RESISTOR 1/4W 820K	1	
R107		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R108		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R109		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R110,11		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R112		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R113		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R114		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R115-18		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R119		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R120		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R121		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R122,23		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	2	
R124		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R125		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R126		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R127		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R128-30		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	3	
R131		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R132		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R133		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	1	
R134		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R135		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R136		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R137-39		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R140		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R141-43		ERDS2TJ563	C.RESISTOR 1/4W 56K	3	
R144		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R145		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R147,48		ERDS2TJ563	C.RESISTOR 1/4W 56K	2	
R149		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	1	
R150,51		ERDS2TJ563	C.RESISTOR 1/4W 56K	2	
R152		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R153		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R154		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R155		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R156		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R157		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R158		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R159		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R160		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R161-63		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R164-66		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R167		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R168		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R169		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R170		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R171		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R172-74		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R175		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R176,77		ERDS2TJ563	C.RESISTOR 1/4W 56K	2	
R178		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R180		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R181,82		ERDS2TJ123	C.RESISTOR 1/4W 12K	2	
R186		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R188,89		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	2	
R190		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R191		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R192		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R193		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R194		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R195		ERDS2TJ334	C.RESISTOR 1/4W 330K	1	
R196		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	1	
R197		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R198		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R199		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R200,01		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R202		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R203		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R204		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R205		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R206		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R207		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R208		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R209		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R210		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R211		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R212		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R213		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R214		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R215		ERDS2TJ184	C.RESISTOR 1/4W 180K	1	
R216		ERDS2TJ154	C.RESISTOR 1/4W 150K	1	
R217		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R219		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R220		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R221		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R224		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R246		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R247		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R249		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R250		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R251		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R252-54		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R255		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R256		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R257		ERDS2TJ394	C.RESISTOR 1/4W 390K	1	
R258,59		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	2	
R260		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R261		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R262		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R263		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R264		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R265		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R270,71		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	2	
R274-77		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R278		ERDS2TJ564	C.RESISTOR 1/4W 560K	1	
R279,80		ERDS2TJ683	C.RESISTOR 1/4W 68K	2	
R285-88		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R289		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R290		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R291		ERDS2TJ184	C.RESISTOR 1/4W 180K	1	
R292,93		ERDS2TJ333	C.RESISTOR 1/4W 33K	2	
R294		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R295		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R296		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R297,98		ERDS2TJ273	C.RESISTOR 1/4W 27K	2	
R299		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R300		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R301		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R302		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R305		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R306		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R307		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R308		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R309		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R310,11		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R312		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R313		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R314-16		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R317		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R318-20		ERDS2TJ224	C.RESISTOR 1/4W 220K	3	
R321		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R322		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R323		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R324		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R325		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R326		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R327		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R328		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R329		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R330		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R331		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R332		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R333		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R334		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R335		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R336		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R337		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R338		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R339		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R340		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R341-43		ERDS2TJ224	C.RESISTOR 1/4W 220K	3	
R344		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R345		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R346		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R347		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R348		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R349		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R350		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R351		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R352		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R353		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R354		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R355		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R356		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R357		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R358		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R359		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R360		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R361		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R362		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R363		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R364-67		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R368		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R369-72		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R373		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R374		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R375		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R376		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R377		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R378		ERDS2TJ564	C.RESISTOR 1/4W 560K	1	
R379		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R380		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R381		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R383		ERDS2TJ564	C.RESISTOR 1/4W 560K	1	
R384		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R385		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R386		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R387		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R388		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R389		ERDS2TJ564	C.RESISTOR 1/4W 560K	1	
R390		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R391		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R392		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R393		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R394		ERDS2TJ564	C.RESISTOR 1/4W 560K	1	
R395		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R396		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R397		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R398		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R399,00		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R401		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R402-05		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R406		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R407		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R408		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R409		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R410		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R411,12		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R413		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R415,16		EROS2CHF4701	M.RESISTOR 1/4W 4.7K	2	
R417		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R418,19		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	2	
R420		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R421		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R422		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R423		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R424		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R425		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R426		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R427		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R428		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	1	
R430		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R431		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R432		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R435		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R436		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R437		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R448		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R450		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R451,52		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R453		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R454		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R455,56		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R457		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R458,59		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R460		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R461,62		ERDS2TJ224	C.RESISTOR 1/4W 220K	2	
R463,64		ERDS2TJ124	C.RESISTOR 1/4W 120K	2	
R465		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R466		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R467		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R468,69		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R470		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R471		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R480,81		ERDS2TJ104	C.RESISTOR 1/4W 100K	2	
R483		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R484		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R485-91		ERDS2TJ103	C.RESISTOR 1/4W 10K	7	
R493		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R494		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R495		ERDS2TO	C.RESISTOR 1/4W 0	1	
R496,97		ERDS2TJ6R8	C.RESISTOR 1/4W 6.8	2	
R501		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R502		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R503		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R504		ERDS2TJ274	C.RESISTOR 1/4W 270K	1	
R505-10		ERDS2TJ563	C.RESISTOR 1/4W 56K	6	
R550-52		ERDS2TJ563	C.RESISTOR 1/4W 56K	3	
R553		ERDS2TJ334	C.RESISTOR 1/4W 330K	1	
R554-59		ERDS2TJ104	C.RESISTOR 1/4W 100K	6	
R560,61		ERDS2TJ391	C.RESISTOR 1/4W 390	2	
R562		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R563		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R564		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R565		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R566		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R567		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R568		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R569		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R571		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R574		ERDS2TO	C.RESISTOR 1/4W 0	1	
R576		ERDS2TO	C.RESISTOR 1/4W 0	1	
R578		ERDS2TO	C.RESISTOR 1/4W 0	1	
R579		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R581,82		ERDS2TO	C.RESISTOR 1/4W 0	2	
R704-06		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R713		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R714,15		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R716		ERDS2TJ5R6	C.RESISTOR 1/4W 5.6	1	
R717		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R718		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R719,20		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R721		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R722		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R723,24		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R839		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R846		ERDS2TO	C.RESISTOR 1/4W 0	1	
R850		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R851		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R852		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R853		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R854		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R855		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R856		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R857		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R858		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R859		ERDS2TJ121	C.RESISTOR 1/4W 120	1	
R860		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R861		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R862-64		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R865		ERDS2TJ334	C.RESISTOR 1/4W 330K	1	
R866		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R867		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R868		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R869		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	
R870		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R871		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R872		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R873		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R874		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R875		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R893		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R900		ERDS2TJ334	C.RESISTOR 1/4W 330K	1	
R901		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
SW1,W2		VSR0032	VOLTAGE SELECT SWITCH	2	
TP1-P8		VJR0400Y	TEST POINT	8	
TP10-16		VJR0400Y	TEST POINT	7	
TP19-23		VJR0400Y	TEST POINT	5	
TP25-27		VJR0400Y	TEST POINT	3	
TP31-44		VJR0400Y	TEST POINT	14	
TP46		VJR0400Y	TEST POINT	1	
TP49,50		VJR0400Y	TEST POINT	2	
TP52		VJR0400Y	TEST POINT	1	
TP66		VJR0400Y	TEST POINT	1	
TP74		VJR0400Y	TEST POINT	1	
TP76-92		VJR0400Y	TEST POINT	17	
TP94		VJR0400Y	TEST POINT	1	
TP96,97		VJR0400Y	TEST POINT	2	
TP102-06		VJR0400Y	TEST POINT	5	
TPG1-G3		VJR0400B	TEST POINT	3	
VC1		ECV1ZW30X53T	V.CAPACITOR 30P	1	
VL1		VLT0563	TRANSFORMER	1	
VR1		VRV0109B104	V.RESISTOR 100K	1	
VR2		VRV0109B103	V.RESISTOR 10K	1	
VR3-R5		VRV0109B203	V.RESISTOR 20K	3	
VR6		VRV0109B104	V.RESISTOR 100K	1	
VR7		VRV0109B502	V.RESISTOR 5K	1	
VR8,R9		VRV0109B104	V.RESISTOR 100K	2	
VR10		VRV0109B503	V.RESISTOR 50K	1	
VR12-14		VRV0109B103	V.RESISTOR 10K	3	
VR15		VRV0109B502	V.RESISTOR 5K	1	
VR16-18		VRV0109B104	V.RESISTOR 100K	3	
VR19,20		VRV0109B503	V.RESISTOR 50K	2	
VR25		VRV0109B202	V.RESISTOR 2K	1	
VR27,28		VRV0109B202	V.RESISTOR 2K	2	
VR29		VRV0109B103	V.RESISTOR 10K	1	
VR32		VRV0109B502	V.RESISTOR 5K	1	
VR33		VRV0109B202	V.RESISTOR 2K	1	
VR34,35		VRV0109B501	V.RESISTOR 500	2	
VR36,37		VRV0109B503	V.RESISTOR 50K	2	
VR38		VRV0109B501	V.RESISTOR 500	1	
VR39,40		VRV0109B502	V.RESISTOR 5K	2	
VR41,42		VRV0109B103	V.RESISTOR 10K	2	
VR43		VRV0109B203	V.RESISTOR 20K	1	
X1		VSX0217	CRYSTAL OSCILLATOR	1	
X2		VSX0081	CRYSTAL OSCILLATOR	1	
X4		VSX0126	CRYSTAL OSCILLATOR	1	
			MISCELLANEOUS		
		VJF0300	BINDER	6	
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VXA2246	P.C.B.SHIELD PLATE	1	
		XYNV3+K6FR	SCREW	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP86047K L6 SYSCON & TC

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP86047K	P.C.BOARD W/COMPONENT		
L6			SYSCON & TC		
B300		VSB0011	BATTERY	1	
B301		VSB0010	BATTERY	1	
			CAPACITORS		
C1		ECEA1AKA221	E.CAPACITOR 10V 220U	1	
C2		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C3		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C4		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C5,C6		ECUM1H330JCN	C.CAPACITOR CH 50V 33P	2	
C7-C9		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3	
C10		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C11		ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
C12		ECUM1H182KBN	C.CAPACITOR CH 50V 1800P	1	
C13		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C14		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C15		ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C16-28		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	13	
C30-32		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3	
C33		ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C34		ECEA1AU471	E.CAPACITOR 10V 470U	1	
C35,36		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C37		ECQM1H222JV	P.CAPACITOR 50V 2200P	1	
C38		ECEA1HKAOR1	E.CAPACITOR 50V 0.1U	1	
C39,40		ECEA1CKA100	E.CAPACITOR 16V 10U	2	
C41		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C42,43		ECEA1CKA100	E.CAPACITOR 16V 10U	2	
C44		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C45,46		ECEA1CKA100	E.CAPACITOR 16V 10U	2	
C47-51		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	5	
C52		ECUM1H331JCN	C.CAPACITOR CH 50V 330P	1	
C53-64		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	12	
C66,67		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C70-74		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	5	
C76		ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1	
C77		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C78-80		ECEA1CKA100	E.CAPACITOR 16V 10U	3	
C82-85		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	4	
C86-92		ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	7	
C93		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C94		ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
C95		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C96		ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C97,98		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C99		ECQP1H392JZ	P.CAPACITOR 50V 3900P	1	
C100		ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C101		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C102,03		ECEA1HKA010	E.CAPACITOR 50V 1U	2	
C104		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C105,06		ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	2	
C108-11		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	4	
C113-21		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	9	
C123,24		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C127-31		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	5	
C132		ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C133		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C135		ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1	
C300		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C301		ECQM1H104JF	P.CAPACITOR 50V 0.1U	1	
C302		ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C303,04		ECUM1H330JCN	C.CAPACITOR CH 50V 33P	2	
C305		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C306,07		ECUM1H330JCN	C.CAPACITOR CH 50V 33P	2	
C308-14		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	7	
C315,16		ECUM1H150JCN	C.CAPACITOR CH 50V 15P	2	
C317-19		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3	
C320,21		ECUM1H180JCN	C.CAPACITOR CH 50V 18P	2	
C322-25		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	4	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C326		ECUM1H101JCN	C.CAPACITOR CH 50V 100P	1	
C327,28		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C329		ECEA1EKA100	E.CAPACITOR 25V 10U	1	
C330		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C331		ECEA1EKA100	E.CAPACITOR 25V 10U	1	
C332		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C333		ECEA1EKA100	E.CAPACITOR 25V 10U	1	
C336		ECRHA030E11	V.CAPACITOR 30P	1	
C337		ECUN1H020CCN	C.CAPACITOR CH 50V 2P	1	
C338		ECUM1H390JCN	C.CAPACITOR CH 50V 39P	1	
C339-41		ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	3	
C342		ECUM1H330JCN	C.CAPACITOR CH 50V 33P	1	
C343		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C344		ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C346		ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1	
C347		ECEA1VKA4R7	E.CAPACITOR 35V 4.7U	1	
C348		ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C349		ECUM1H222KBN	C.CAPACITOR CH 50V 2200P	1	
C350		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C351		ECUM1H120JCN	C.CAPACITOR CH 50V 12P	1	
C352		ECEA1EKN470	E.CAPACITOR 25V 47U	1	
C358		ECEA1VKA4R7	E.CAPACITOR 35V 4.7U	1	
C359,60		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C361,62		ECEA1EKN4R7	E.CAPACITOR 25V 4.7U	2	
C363		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C364		ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C365		ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C366		ECUM1H150JCN	C.CAPACITOR CH 50V 15P	1	
C367,68		ECEA1CKA100	E.CAPACITOR 16V 10U	2	
C369,70		ECQM1H102JV	P.CAPACITOR 50V 1000P	2	
C371		ECEA1EKA100	E.CAPACITOR 25V 10U	1	
C378-82		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	5	
C390-92		ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3	
D1		MA153	DIODE	1	
D2		MA151WK	DIODE	1	
D3-D6		MA151K	DIODE	4	
D8		MA151WK	DIODE	1	
D11-14		MA151K	DIODE	4	
D302		MA1030	ZENER DIODE	1	
D303,04		HZ3ALL	DIODE	2	
D305,06		MA4030M	DIODE	2	
D311-13		MA151K	DIODE	3	
IC1		MC74HC74F	IC	1	
IC2,C3		MC74HC164F	IC	2	
IC4		MC14020BF	IC	1	
IC5		TL7705CPB	IC	1	
IC6		UPD780C	IC	1	
IC7,C8		MC74HC541F	IC	2	
IC9		VSI0393	IC	1	
IC10		VSI0234	IC	1	
IC11-14		MC74HC138F	IC	4	
IC15		TMPZ84C43AF6	IC	1	
IC16		UPD71054G	IC	1	
IC17		TMPZ84C43AF6	IC	1	
IC18		MC34051M	IC	1	
IC19		TMPZ84C30AF6	IC	1	
IC20,21		MC14094BF	IC	2	
IC22		MC14013BF	IC	1	
IC23		UPC451G	IC	1	
IC25,26		UPC393G	IC	2	<R>
IC27		MB89363BPF	IC	1	
IC28-33		MC14021BF	IC	6	
IC34,35		MB89363BPF	IC	2	
IC36		HD75451AP	IC	1	
IC39		MC14538BF	IC	1	
IC40		UPC393G	IC	1	<R>
IC42-44		M51946BFP	IC	3	
IC45		UPC393G	IC	1	<R>
IC46,47		MC14538BF	IC	2	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC50		MC74HCU04F	IC	1	
IC51		MC74HC04F	IC	1	
IC52		SN74LS38NS	IC	1	
IC54		MC74HC00F	IC	1	
IC55		MC74HC32F	IC	1	
IC56-58		MN4050BS	IC	3	
IC59-61		MC14049UBF	IC	3	
IC62		MC74HC132F	IC	1	
IC63		MC14538BF	IC	1	
IC64		MN4075BS	IC	1	
IC65		MN4030BS	IC	1	
IC68,69		MB89363BPF	IC	2	
IC70,71		MC14094BF	IC	2	
IC72		MB89363BPF	IC	1	
IC73		MB621176	IC	1	
IC300		TL7705CPB	IC	1	
IC301		MC74HC393F	IC	1	
IC302		UPD78C10G	IC	1	
IC303		UPD71055G	IC	1	
IC304		MC74HC373F	IC	1	
IC305		VSI0491	IC	1	
IC306		HM6116LFP-2	IC	1	
IC307		MC74HC138F	IC	1	
IC308		MN51040VPC	IC	1	
IC309		MC74HC374F	IC	1	
IC310		MC74HC541F	IC	1	
IC311,12		MC74HC374F	IC	2	
IC313		MN1227A-M	IC	1	
IC314		MC14053BF	IC	1	
IC315		UPD7503G597	IC	1	
IC316,17		MC14052BF	IC	2	
IC318		UPC319G	IC	1	
IC319		NJM4556MB	IC	1	
IC321		MC74HC04F	IC	1	
IC322		MC74HC08F	IC	1	
IC323		SN74LS86NS	IC	1	
IC324,25		MC74HC32F	IC	2	
IC6S		VJS2336A040	CONNECTOR (FEMALE)	1	
IC9S		VJS2336A028	CONNECTOR (FEMALE)	1	
IC305S		VJS2336A028	CONNECTOR (FEMALE)	1	
L1		VLQ0214	COIL 50UH	1	
L2		VLQEL09F102K	COIL 1000UH	1	
L300,01		VLP0017	COIL	2	
L302		VLQEL06F101J	COIL 100UH	1	
L304		VLQEL06F121J	COIL 120UH	1	
P1		VJP1583	CONNECTOR(MALE)	1	
Q1		2SB643	TRANSISTOR	1	
Q2,Q3		2SD601	TRANSISTOR CHIP	2	
Q4-Q9		DTC114YK	TRANSISTOR-RESISTOR	6	
Q10-21		DTC114YK	TRANSISTOR-RESISTOR	12	
Q24-28		DTC114YK	TRANSISTOR-RESISTOR	5	
Q30		DTC114YK	TRANSISTOR-RESISTOR	1	
Q35-39		DTC114YK	TRANSISTOR-RESISTOR	5	
Q41-44		DTC114YK	TRANSISTOR-RESISTOR	4	
Q46-51		DTC114YK	TRANSISTOR-RESISTOR	6	
Q54-57		DTC114YK	TRANSISTOR-RESISTOR	4	
Q62		UN2114	TRANSISTOR-RESISTOR	1	
Q63-65		DTC114YK	TRANSISTOR-RESISTOR	3	
Q68		DTC114YK	TRANSISTOR-RESISTOR	1	
Q72		2SD946A	TRANSISTOR	1	
Q303		2SB710	TRANSISTOR	1	
Q304		2SD601	TRANSISTOR CHIP	1	
Q305		2SB710	TRANSISTOR	1	
Q306,07		2SD601	TRANSISTOR CHIP	2	
Q308,09		2SB710	TRANSISTOR	2	
Q310		2SD601	TRANSISTOR CHIP	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
Q311		2SB710	TRANSISTOR	1	
Q313		DTC114YK	TRANSISTOR-RESISTOR	1	
Q314		2SK128	TRANSISTOR	1	
			RESISTORS		
R1		ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R2		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3,R4		ERJ6GEYJ681	M.RESISTOR CH 1/10W 680	2	
R5,R6		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R7		ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R8		ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R9		ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R10		ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R11		ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R12		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R13		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R14		ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R15		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R16,17		ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	2	
R18		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R19		ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R22		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R23		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R24		ERJ6GEYJ474	M.RESISTOR CH 1/10W 470K	1	
R25		ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R26,27		ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	2	
R28		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R29		ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R30		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R31		ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R32		ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R33		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R34		ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R35		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R36		ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R37		ERDS1TJ220	C.RESISTOR 1/2W 22	1	
R38		ERJ6GEYJ474	M.RESISTOR CH 1/10W 470K	1	
R39		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R40		ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R41		ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R42,43		ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	2	
R44		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R45		ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R46,47		ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	2	
R48		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R49		ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R50-53		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	4	
R54-57		ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	4	
R58		ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R59		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R60		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R61-63		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	3	
R64-66		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	3	
R67-69		ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	3	
R70-72		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	3	
R73		ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R74		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R75		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R76		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R77		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R79		ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R80-99		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	20	
R100-02		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	3	
R103		ERQ12AJ3R9P	FUSE 1/2W 3.9	1	
R104		ERJ6GEYJ393	M.RESISTOR CH 1/10W 39K	1	
R105		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R107-12		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	6	
R113,14		ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	2	
R115,16		ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	2	
R117-19		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	3	
R120,21		ERJ6GEYJ683	M.RESISTOR CH 1/10W 68K	2	
R122,23		ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	2	
R124		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R129		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R130		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R131		ERJ6GEYJ474	M.RESISTOR CH 1/10W 470K	1	
R132		ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R133,34		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R135		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R136-43		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	8	
R148,49		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R150		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R151		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R152		ERJ6GEYJ154	M.RESISTOR CH 1/10W 150K	1	
R153		ERJ6GEYJ393	M.RESISTOR CH 1/10W 39K	1	
R154,55		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R156		ERJ6GEYJ393	M.RESISTOR CH 1/10W 39K	1	
R157-59		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	3	
R160		ERJ6GEYJ823	M.RESISTOR CH 1/10W 82K	1	
R161,62		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R163		ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R164		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R165		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R166		ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R167,68		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R169		ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R170		ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R171		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R172		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R173,74		ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	2	
R175		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R176		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R177-79		ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	3	
R180		VREO034E623	RESISTOR	1	
R181,82		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	2	
R183		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R184		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R185,86		ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	2	
R187,88		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	2	
R189		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R190		ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R193		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R195		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R300		ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R301,02		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R303		ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R304		ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R305,06		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	2	
R307,08		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	2	
R309		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R310		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R311		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R312-16		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	5	
R317		ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R318-25		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	8	
R326		ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R327-30		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	4	
R331		ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	
R339		ERJ6GEYJ334	M.RESISTOR CH 1/10W 330K	1	
R340-42		ERJ6GEYJ154	M.RESISTOR CH 1/10W 150K	3	
R343		ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1	
R344		ERJ6GEYG164	M.RESISTOR CH 1/10W 160K	1	
R345		ERJ6GEYJ273	M.RESISTOR CH 1/10W 27K	1	
R346		ERJ6GEYJ823	M.RESISTOR CH 1/10W 82K	1	
R347-50		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	4	
R351		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R352		ERJ6GEYJ824	M.RESISTOR CH 1/10W 820K	1	
R353		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R354		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R355		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R356		ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R357,58		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	2	
R359		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R360		ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R361,62		ERJ6GEYJ4R7	M.RESISTOR CH 1/10W 4.7	2	
R363		ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R364		ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R365		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R366		ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R367		ERJ6GEYJ394	M.RESISTOR CH 1/10W 390K	1	
R368		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R369		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R370		ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R371		ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	
R372		ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R373		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R374		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R375		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R376		ERJ6GEYJ683	M.RESISTOR CH 1/10W 68K	1	
R377		ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R378		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R379		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R380		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R381		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R382,83		ERJ6GEYJ273	M.RESISTOR CH 1/10W 27K	2	
R384		ERJ6GEYJ681	M.RESISTOR CH 1/10W 680	1	
R385		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R386		ERJ6GEYJ823	M.RESISTOR CH 1/10W 82K	1	
R387		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R391		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R392		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R393		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R394		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R395		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R396		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R397		ERJ6GEYG911	M.RESISTOR CH1/10W 910	1	
R398		ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R399		ERJ6GEYJ394	M.RESISTOR CH 1/10W 390K	1	
R400,01		ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	2	
R402		ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R409		ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	1	
R410		ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R411		ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R413		ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R414,15		ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	2	
RA1-A4		EXBR88103J	RESISTOR & RESISTOR 10K	4	
RA5		EXBR88333J		1	
RA6-A9		EXBR88103J	RESISTOR & RESISTOR 10K	4	
RA10-13		EXBR88103J	RESISTOR & RESISTOR 10K	4	
RA300		EXBR88103J	RESISTOR & RESISTOR 10K	1	
RA301		EXBR84103J	RESISTOR&RESISTOR 10K	1	
RA302		EXBR84104J	RESISTOR-RESISTOR	1	
RA303		EXBR88103J	RESISTOR & RESISTOR 10K	1	
SW1-W6		VST0096	SWITCH	6	
SW300		VST0096	SWITCH	1	
SW301		VSS0241	SWITCH	1	
SW304,05		VJP1990	CONNECTOR	2	
SW306,07		VSR0045	SWITCH	2	
SW305S		VJS1990	CONNECTOR	1	
TP1-P3		VJR0400B	TEST POINT	3	
TP6		VJR0400Y	TEST POINT	1	
TP17		VJR0400Y	TEST POINT	1	
TP19-21		VJR0400Y	TEST POINT	3	
TP25		VJR0400Y	TEST POINT	1	
TP301,02		VJR0400Y	TEST POINT	2	
TP304,05		VJR0400Y	TEST POINT	2	
TP306		VJR0400B	TEST POINT	1	
VR301		VRV0112B102	V.RESISTOR 1K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
X1		VSX0150	CRYSTAL OSCILLATOR	1	
X300		VSX0178	CRYSTAL OSCILLATOR	1	
X301		VSX0156	CRYSTAL OSCILLATOR	1	
X303		VSX0098	CRYSTAL OSCILLATOR	1	
X304		VSX0094	CRYSTAL OSCILLATOR	1	
			MISCELLANEOUS		
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VXA2246	P.C.B.SHIELD PLATE	1	
		XYNV3+K6FR	SCREW	6	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP86078A S MOTHER

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP86078A	P.C.BOARD W/COMPONENT		
S0			S MOTHER		
			CAPACITORS		
C1,C2		ECEA1EU101	E.CAPACITOR 25V 100U	2	
C3,C4		ECEA1CU101	E.CAPACITOR 16V 100U	2	
CN1		VJP1230T	CONNECTOR(MALE) 3P	1	
CN3		VJP1230T	CONNECTOR(MALE) 3P	1	
CN5		VJP1230T	CONNECTOR(MALE) 3P	1	
P52		VJP1152	CONNECTOR(MALE)	1	
P53		VJP1153	CONNECTOR(MALE)	1	
P54		VJP1152	CONNECTOR(MALE)	1	
P57		VJP1145	CONNECTOR(MALE)	1	
P59		VJP1145	CONNECTOR(MALE)	1	
P60		VJP1153	CONNECTOR(MALE)	1	
P61		VJP1147	CONNECTOR(MALE)	1	
P62		VJP1145	CONNECTOR(MALE)	1	
P63		VJP1188	CONNECTOR(MALE)	1	
P64		VJP1147	CONNECTOR(MALE)	1	
P65		VJP1153	CONNECTOR(MALE)	1	
P66		VJP1145	CONNECTOR(MALE)	1	
P67,68		VJP1153	CONNECTOR(MALE)	2	
P69		VJP1151	CONNECTOR(MALE)	1	
P70		VJP1146	CONNECTOR(MALE) 10P	1	
P71		VJP1151	CONNECTOR(MALE)	1	
P72		VJP1149	CONNECTOR(MALE)	1	
P73		VJP1221	CONNECTOR(MALE)	1	
P74		VJP1146	CONNECTOR(MALE) 10P	1	
P75		VJP1145	CONNECTOR(MALE)	1	
P76		VJP1146	CONNECTOR(MALE) 10P	1	
P77		VJP1143	CONNECTOR(MALE)	1	
P78		VJP1146	CONNECTOR(MALE) 10P	1	
P87		VJP1152	CONNECTOR(MALE)	1	
POWER3		VJP1559	CONNECTOR(MALE)	1	
POWER4,R5		VJP1561	CONNECTOR(MALE)	2	
S3-S6		VJS2338A080	CONNECTOR (FEMALE)	4	
S9		VJS2338A080	CONNECTOR (FEMALE)	1	
S10		VJS2338A080	CONNECTOR (FEMALE)	1	
			MISCELLANEOUS		
		VMP1070	P.C.B.HOLDER ANGLE	1	
		VMP1071	P.C.B.HOLDER ANGLE	1	
		XTV3+10F	SCREW	12	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP88037A S3 C PB

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP88037A	P.C.BOARD W/COMPONENT		
S3			C PB		
			CAPACITORS		
C1		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C2		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C3		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C5		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C6		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C7,C8		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C10,11		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C12		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C13-16		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C17		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C18		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C19		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C20		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C21		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C22-24		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C25,26		ECEA1CU470	E.CAPACITOR 16V 47U	2	
C27		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C28		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C29		ECQP1H101JZ	P.CAPACITOR 50V 100P	1	
C30		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C31-33		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C34		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C35		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C36-38		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C39		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C40		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C41-48		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	8	
C49		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C50		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C51,52		VCM0033	M.CAPACITOR	2	
C53		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C54		ECEA0JSS471	E.CAPACITOR 6.3V 470U	1	
C55		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C56,57		ECKF1H681KB	C.CAPACITOR 50V 680P	2	
C58		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C59,60		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C61		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C62		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C63,64		ECQP1H101JZ	P.CAPACITOR 50V 100P	2	
C65,66		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C67		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C68		ECQP1H121JZ	P.CAPACITOR 50V 120P	1	
C69		ECCF1H100DC	C.CAPACITOR 50V 10P	1	
C70		ECQP1H331JZ	P.CAPACITOR 50V 330P	1	
C71		ECQP1H471JZ	P.CAPACITOR 50V 470P	1	
C72		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C73		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C74		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C75		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C76		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C77		VCM0030	M.CAPACITOR	1	
C78		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C79,80		ECCF1H010CC	C.CAPACITOR 50V 1P	2	
C81,82		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C83,84		ECKF1H102KB	C.CAPACITOR 50V 1000P	2	
C85		ECEA1AN101S	E.CAPACITOR 10V 100U	1	
C86		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C87,88		VCM0032	M.CAPACITOR	2	
C89		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C90		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C91		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C92		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C93		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C94		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C95		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C96,97		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C98		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C99		ECQP1H101JZ	P.CAPACITOR 50V 100P	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C100		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C101,02		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C103,04		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C105		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C106		ECCF1H680JC	C.CAPACITOR 50V 68P	1	
C107		ECCF1H100DC	C.CAPACITOR 50V 10P	1	
C108		ECQP1H221JZ	P.CAPACITOR 50V 220P	1	
C109		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C110,11		ECEA1CU100	E.CAPACITOR 16V 10U	2	
C112		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C113-15		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C116		ECQP1H151JZ	P.CAPACITOR 50V 150U	1	
C117		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C118		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C119		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C120-22		ECEA1CU470	E.CAPACITOR 16V 47U	3	
C123,24		ECEA0JU470	E.CAPACITOR 6.3V 47U	2	
C125		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C126		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C127		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C129-31		ECEA1CU470	E.CAPACITOR 16V 47U	3	
C132		ECEA1CN470SB	E.CAPACITOR 16V 47U	1	
C135,36		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C137		ECCF1H330JC	C.CAPACITOR 50V 33P	1	
D1		MA165	DIODE	1	
D2,D3		MA154WK	DIODE	2	
D4-D9		MA165	DIODE	6	
D10-17		MA165	DIODE	8	
D18		MA165	DIODE	1	OR 1SS119, 1SS254
D19		MA165	DIODE	1	
D20-27		MA165	DIODE	8	OR 1SS119, 1SS254
DL1		VLD0142	DELAY	1	
DL2		VLD0140	DELAY	1	
FL1		VLF0666	FILTER	1	
FL2		VLF0652	FILTER	1	
IC1		AN6308	IC	1	
IC2,C3		AN610P	IC	2	
IC4		AN6308	IC	1	
IC5		CA3127E	IC	1	
IC6-C8		MC10116L	IC	3	
IC9		MC74HC00N	IC	1	
IC10		MN74HC221	IC	1	
IC11-13		UPD4053BC	IC	3	
IC14		AN608P	IC	1	
IC15		MC10116L	IC	1	
IC16		SN74LS123N	IC	1	
IC17		MC74HC20N	IC	1	
IC18		NE5539N	IC	1	
IC19		LM6361N	IC	1	
IC20		TL082CP	IC	1	
IC21		VCR0201	IC	1	
IC22		MC74HC4053N	IC	1	
IC23		TL592BP	IC	1	
IC24		TL810CP	IC	1	
IC25		TL607CP	IC	1	
IC26,27		TL082CP	IC	2	
IC28		MN74HC221	IC	1	
IC29		TL082CP	IC	1	
IC30		AN78M09	IC	1	
IC31		AN79N09	IC	1	
IC32		AN79N05	IC	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
L1	VLQEL06F101K	COIL 100UH	1	
L2	VLQEL06F5R6J	COIL 56UH	1	
L3	EIK7EN014B	COIL H	1	
L4-L9	VLQEL06F101K	COIL 100UH	6	
L10	VLQEL06F150J	COIL 15UH	1	
L11-14	VLQEL06F101K	COIL 100UH	4	
L17-20	VLQEL06F101K	COIL 100UH	4	
L21	EIR7QF015B	COIL H	1	
L22	VLQEL06F390J	COIL 39UH	1	
L23-27	VLQEL06F101K	COIL 100UH	5	
L28,29	VLQ0242	COIL 30UH	2	
L31	VLQ0242	COIL 30UH	1	
L32,33	VLQEL06F101K	COIL 100UH	2	
Q1	2SC2206	TRANSISTOR	1	(B,C)
Q2	2SA1254	TRANSISTOR	1	
Q3,Q4	2SC2206	TRANSISTOR	2	(B,C)
Q5	2SA1254	TRANSISTOR	1	
Q6	2SC2206	TRANSISTOR	1	(B,C)
Q7,Q8	2SA1254	TRANSISTOR	2	
Q9	2SC2206	TRANSISTOR	1	(B,C)
Q10	2SC2206	TRANSISTOR	1	(B,C)
Q11,12	UN1213	TRANSISTOR-RESISTOR	2	
Q13,14	2SC2206	TRANSISTOR	2	(B,C)
Q15	2SA1254	TRANSISTOR	1	
Q16	2SC2636	TRANSISTOR	1	
Q17,18	2SA1005	TRANSISTOR	2	(L)
Q19	2SC2206	TRANSISTOR	1	(B,C)
Q20	2SA1254	TRANSISTOR	1	
Q21	2SC2634	TRANSISTOR	1	
Q22	2SA1127	TRANSISTOR	1	
Q23	2SC2206	TRANSISTOR	1	(B,C)
Q25,26	2SC2206	TRANSISTOR	2	(B,C)
Q27	2SA1254	TRANSISTOR	1	
Q30	2SC2206	TRANSISTOR	1	(B,C)
Q31	2SA1254	TRANSISTOR	1	
		RESISTORS		
R1	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R2	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R3	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R4	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R5,R6	ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R7	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R8	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R9	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R10	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R11	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R12,13	ERDS2TJ271	C.RESISTOR 1/4W 270	2	
R16,17	ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R18	ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R19	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R20	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R21	ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R22	ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R23	EROS2CHF2940	M.RESISTOR 1/4W 294	1	
R24	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R25	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R26	EROS2CHF3320	M.RESISTOR 1/4W 332	1	
R27-29	ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R30	ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R31	ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R32	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R33,34	ERDS2TJ220	C.RESISTOR 1/4W 22	2	
R35	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R36	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R37,38	ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R39	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R40,41	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R42,43	ERDS2TJ271	C.RESISTOR 1/4W 270	2	
R44	ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R45	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R46	ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R47	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R48	ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R49	ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R50	ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R51	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R52	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R53	ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R54-56	ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R57	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R58,59	ERDS2TJ220	C.RESISTOR 1/4W 22	2	
R60	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R61	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R62	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R63	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R64	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R65	ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R66	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R67	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R68	ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R69	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R70	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R72	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R73	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R74	ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R75	EROS2CHF2940	M.RESISTOR 1/4W 294	1	
R76	ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R77	ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R78	EROS2CHF3010	M.RESISTOR 1/4W 301	1	
R79	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R80	ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R81	ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R82	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R83	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R84,85	ERDS2TJ681	C.RESISTOR 1/4W 680	2	
R86,87	ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R88	ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R89,90	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R91	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R92	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R93	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R94,95	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R96	ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R97,98	ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R99	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R100	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R101	ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R102,03	ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R106,07	ERJ6GEYJ150	M.RESISTOR CH1/16W 15	2	
R108,09	EROS2CHF3321	M.RESISTOR 1/4W 3.32K	2	
R110	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R113	ERSA22G222	M.RESISTOR 2.2K	1	
R114,15	ERDS2TJ681	C.RESISTOR 1/4W 680	2	
R117-19	ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R120	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R121-25	ERDS2TJ103	C.RESISTOR 1/4W 10K	5	
R126	ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R127,28	ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R131	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R132	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R133	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R134	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R135	ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R136,37	ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R138,39	ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R140,41	ERDS2TJ333	C.RESISTOR 1/4W 33K	2	
R142,43	ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R145	ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R146	ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R147	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R148	ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R149,50	ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R151	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R152		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R153		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R154		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R155		EROS2CHF3160	M.RESISTOR 1/4W 316	1	
R156		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R157		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R158		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R159		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R160		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R161,62		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R163		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R164		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R165,66		ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R167		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R168		ERN55EC5300	METAL 1/4W,1/8W 530	1	
R169		ERN55EC2130	METAL 1/4W,1/8W 213	1	
R170		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R171		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R172		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R176		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R178		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R179		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R180		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R181		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R182		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R183		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R184		EROS2CHF3320	M.RESISTOR 1/4W 332	1	
R185		EROS2CHD8250	M.RESISTOR 1/4W 825	1	
R186		EROS2CHD4020	M.RESISTOR 1/4W 402	1	
R187		EROS2CHD1001	M.RESISTOR 1/4W 1K	1	
R188		EROS2CHD1820	M.RESISTOR 1/4W 182	1	
R189		EROS2CHD2212	M.RESISTOR 1/4W 22.1K	1	
R190		EROS2CKF4701	M.RESISTOR 1/4W 4.7K	1	
R191		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R192		EROS2CKF2101	M.RESISTOR 1/4W 2.1K	1	
R193		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R194		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R195		EROS2CHF1001	M.RESISTOR 1/4W 1K	1	
R196		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R197		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R201		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R202		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R203		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R204,05		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R206		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R207,08		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R209		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R210		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R211,12		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R214,15		EROS2CHF1470	M.RESISTOR 1/4W 147	2	
R216,17		ERDS2TJ681	C.RESISTOR 1/4W 680	2	
R218		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R219,20		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R221		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R222		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R223,24		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R225,26		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R227		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R228		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R229		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R230		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R231		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R232		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R233		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R234		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R235-38		ERDS2TJ102	C.RESISTOR 1/4W 1K	4	
R239,40		ERDS2TJ154	C.RESISTOR 1/4W 150K	2	
R241,42		ERDS2TJ683	C.RESISTOR 1/4W 68K	2	
R243,44		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R245,46		ERDS2TO	C.RESISTOR 1/4W 0	2	
R247		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R248		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R249		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R250-52		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R253		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R254		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R255		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R256		ERDS2TO	C.RESISTOR 1/4W 0	1	
R257		ERG1ANJP220	M.RESISTOR 1W 22	1	
R258		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R259		ERSA18G332	M.RESISTOR 1/8W 3.3K	1	
R260,61		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R262		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R263,64		EROS2CHF5900	M.RESISTOR 1/4W 590	2	
R265		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R266		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R267,68		ERDS2TJ225	C.RESISTOR 1/4W 2.2M	2	
R269		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R270		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
RA104		EXBF7E681J	COMBI R-R 680	1	
RA105		EXBF5E681J	COMBI R-R 680	1	
RA144		EXBF7E681J	COMBI R-R 680	1	
SW1-W7		VJP1563	CONNECTOR(MALE)	7	
TP1-P9		VJR0400Y	TEST POINT	9	
TP10-18		VJR0400Y	TEST POINT	9	
TPG1-G5		VJR0400B	TEST POINT	5	
VR1,R2		VRV0063B301	V.RESISTOR 300	2	
VR3,R4		VRV0063B101	V.RESISTOR 100	2	
VR5		VRV0063B502	V.RESISTOR 5K	1	
VR6		VRV0063B102	V.RESISTOR 1K	1	
VR7		VRV0063B501	V.RESISTOR 500	1	
VR8		VRV0085B203	V.RESISTOR 20K	1	
VR9		VRV0063B501	V.RESISTOR 500	1	
VR10-13		VRV0063B502	V.RESISTOR 5K	4	
VR14,15		VRV0063B202	V.RESISTOR 2K	2	
VR18		VRV0063B102	V.RESISTOR 1K	1	
VR19		VRV0063B501	V.RESISTOR 500	1	
VR20		VRV0063B203	V.RESISTOR 20K	1	
VR21		VRV0063B102	V.RESISTOR 1K	1	
VR23		VRV0063B501	V.RESISTOR 500	1	
VR24		VRV0063B203	V.RESISTOR 20K	1	
VR26		VRV0063B102	V.RESISTOR 1K	1	
VR27		VRV0063B204	V.RESISTOR 200K	1	
VR28		VRV0063B502	V.RESISTOR 5K	1	
VR29		VRV0063B103	V.RESISTOR 10K	1	
			MISCELLANEOUS		
		VJR0085	PIN	5	
		VJS1563	SOCKET	6	
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VXA2247	P.C.B. SIELD PLATE	2	
		XYNV3+K6FR	SCREW	6	
	■	VEP80452A	P.C.BOARD W/COMPONENT		PART OF VEP88037A
			C PB SUB1		
			CAPACITORS		
C1		ECQP1H391JZ	P.CAPACITOR 50V 390P	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
L1		VLQEL06F1R5J	COIL 1.5UH	1	
			RESISTORS		
R1		ERDS2TJ270	C.RESISTOR 1/4W 27	1	
R2		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R3		ERDS2TJ330	C.RESISTOR 1/4W 33	1	

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VEP83063B   S4 Y PB

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP83063B	P.C.BOARD W/COMPONENT		
S4			Y PB		
			CAPACITORS		
C1		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C2		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C3		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C4		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C5		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C6		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C7		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C8		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C9		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C10		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C11		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C12-15		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C16		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C17		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C18		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C19		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C20		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C21,22		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C23		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C24		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C25		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C26		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C27		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C28		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C29		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C30-32		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C34		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C35-37		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C38		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C39		ECQP1H471JZ	P.CAPACITOR 50V 470P	1	
C40		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C41-46		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	6	
C47		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C48-50		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C51,52		VCM0034	M.CAPACITOR	2	
C53		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C54		ECEA0JSS471	E.CAPACITOR 6.3V 470U	1	
C55		ECKF1H681KB	C.CAPACITOR 50V 680P	1	
C56		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C57		ECCF1H010CC	C.CAPACITOR 50V 1P	1	
C58		ECKF1H681KB	C.CAPACITOR 50V 680P	1	
C59		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C60,61		ECKF1H102KB	C.CAPACITOR 50V 1000P	2	
C62		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C63		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C64,65		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C66,67		ECQP1H101JZ	P.CAPACITOR 50V 100P	2	
C68,69		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C70		ECQP1H121JZ	P.CAPACITOR 50V 120P	1	
C71		ECCF1H100DC	C.CAPACITOR 50V 10P	1	
C72		ECQP1H331JZ	P.CAPACITOR 50V 330P	1	
C73		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C74		ECQP1H471JZ	P.CAPACITOR 50V 470P	1	
C75		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C76		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C77		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C78		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C79		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C80		VCF0051	FILM	1	
C81		ECCF1H100DC	C.CAPACITOR 50V 10P	1	
C82		ECCF1H010DC	C.CAPACITOR 50V 1P	1	
C83-85		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C86		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C87		ECV1ZW50X53T	TRIMMER 50P	1	
C88		ECEA1AN101S	E.CAPACITOR 10V 100U	1	
C89		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C90		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C91,92		VCM0032	M.CAPACITOR	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C93		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C94		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C95		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C96,97		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C98,99		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C100		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C101		ECQP1H101JZ	P.CAPACITOR 50V 100P	1	
C102		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C103,04		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C105		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C106		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C107		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C108		ECQP1H151JZ	P.CAPACITOR 50V 150U	1	
C109		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C110		ECQP1H431JZ	P.CAPACITOR 50V 430P	1	
C111,12		ECEA1CU100	E.CAPACITOR 16V 10U	2	
C113,14		ECEA1CU470	E.CAPACITOR 16V 47U	2	
C115		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C116		ECQP1H471JZ	P.CAPACITOR 50V 470P	1	
C117		ECQP1H151JZ	P.CAPACITOR 50V 150U	1	
C118		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C119-21		ECEA1CU470	E.CAPACITOR 16V 47U	3	
C122,23		ECEA0JU470	E.CAPACITOR 6.3V 47U	2	
C124		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C125		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C126		ECEA0JU470	E.CAPACITOR 6.3V 47U	1	
C127		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C128-30		ECEA1CU470	E.CAPACITOR 16V 47U	3	
C131,32		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C133		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C135,36		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C137		ECEA1CN220S	E.CAPACITOR 16V 22U	1	
C138		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C1001,02		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C1003,04		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C1005		ECQV1H224JZ	P.CAPACITOR 50V 0.22U	1	
C2001		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C2002		ECQP1H361JZ	P.CAPACITOR 50V 360P	1	
D1		MA165	DIODE	1	
D2,D3		MA154WK	DIODE	2	
D4-D9		MA165	DIODE	6	
D10-21		MA165	DIODE	12	
D22,23		MA165	DIODE	2	OR 1SS119, 1SS254
D24		MA165	DIODE	1	
D25-30		MA165	DIODE	6	OR 1SS119, 1SS254
DL1		VLD0141	DELAY	1	
DL2		VLD0139	DELAY	1	
FL1		VLF0658	FILTER	1	
FL2		VLF0651	FILTER	1	
IC1		AN6308	IC	1	
IC2,C3		AN610P	IC	2	
IC4		AN6308	IC	1	
IC5		CA3127E	IC	1	
IC6-C8		MC10116L	IC	3	
IC9		MC74HC00N	IC	1	
IC10		MC74HC221N	IC	1	
IC11-13		UPD4053BC	IC	3	
IC14		AN608P	IC	1	
IC15		MC10116L	IC	1	
IC16		SN74LS123N	IC	1	
IC17		MC74HC20N	IC	1	
IC18		NE5539N	IC	1	
IC19		LM6361N	IC	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC20		TL082CP	IC	1	
IC21		VCR0201	IC	1	
IC22		MC74HC4053N	IC	1	
IC23		TL592BP	IC	1	
IC24		TL810C	IC	1	
IC25		TL607CP	IC	1	
IC26,27		TL082CP	IC	2	
IC28		MN74HC221	IC	1	
IC29		AN78M09	IC	1	
IC30		AN79N09	IC	1	
IC31		TL082CP	IC	1	
IC32		MC1330A1P	IC	1	
IC33		AN79N05	IC	1	
IC1001		MC1330A1P	IC	1	
IC3001		MPD4053BC	IC	1	
L1		VLQEL06F101K	COIL 100UH	1	
L2		VLQEL06F330J	COIL 33UH	1	
L3		EIK7EN013B	COIL	1	
L4-L9		VLQEL06F101K	COIL 100UH	6	
L10		VLQEL06F150J	COIL 15UH	1	
L11-14		VLQEL06F101K	COIL 100UH	4	
L15		VLQEL06F6R8J	COIL 6.8UH	1	
L17-20		VLQEL06F101K	COIL 100UH	4	
L21		EIR7QF015B	COIL H	1	
L22		VLQEL06F820J	COIL 82UH	1	
L23-27		VLQEL06F101K	COIL 100UH	5	
L28,29		VLQ0242	COIL 30UH	2	
L31		VLQ0242	COIL 30UH	1	
L32,33		VLQEL06F101K	COIL 100UH	2	
L2001		EIR7QF016B	COIL H	1	
L2002		VLQEL06F3R3J	COIL 3.3UH	1	
Q1		2SC2206	TRANSISTOR	1	(B,C)
Q2		2SA1254	TRANSISTOR	1	
Q3,Q4		2SC2206	TRANSISTOR	2	(B,C)
Q5		2SA1254	TRANSISTOR	1	
Q6		2SC2206	TRANSISTOR	1	(B,C)
Q7,Q8		2SA1254	TRANSISTOR	2	
Q9		UN1213	TRANSISTOR-RESISTOR	1	
Q10,11		2SC2206	TRANSISTOR	2	(B,C)
Q12,13		UN1213	TRANSISTOR-RESISTOR	2	
Q14,15		2SC2206	TRANSISTOR	2	(B,C)
Q16		2SA1254	TRANSISTOR	1	
Q17		2SC2636	TRANSISTOR	1	
Q18,19		2SA1005	TRANSISTOR	2	(L)
Q20		2SC2206	TRANSISTOR	1	(B,C)
Q21		2SA1254	TRANSISTOR	1	
Q22		2SC2634	TRANSISTOR	1	
Q23		2SA1127	TRANSISTOR	1	
Q26,27		2SC2206	TRANSISTOR	2	(B,C)
Q28		2SA1254	TRANSISTOR	1	
Q29,30		2SC2206	TRANSISTOR	2	(B,C)
Q31		2SA1254	TRANSISTOR	1	
			RESISTORS		
R1		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R2		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R3		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R4		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R5		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R6,R7		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R8		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R9		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R10		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R11		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R12,13		ERDS2TJ271	C.RESISTOR 1/4W 270	2	
R14		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R15		ERDS2TJ470	C.RESISTOR 1/4W 47	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R16		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R17		EROS2CHF2940	M.RESISTOR 1/4W 294	1	
R18		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R19		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R20		EROS2CHF3320	M.RESISTOR 1/4W 332	1	
R21		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R22		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R23		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R24		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R25,26		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R27		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R28		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R29,30		ERDS2TJ220	C.RESISTOR 1/4W 22	2	
R31		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R32		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R33,34		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R35		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R36,37		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R38,39		ERDS2TJ271	C.RESISTOR 1/4W 270	2	
R40		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R41		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R42		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R43		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R44		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R45		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R46		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R47		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R48		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R49		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R50-52		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R53		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R54,55		ERDS2TJ220	C.RESISTOR 1/4W 22	2	
R56		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R57		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R58		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R59		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R60		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R61		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R62		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R63		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R64		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R65		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R67		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R68		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R69		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R70		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R71		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R72		EROS2CHF2940	M.RESISTOR 1/4W 294	1	
R73		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R74		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R75		EROS2CHF3010	M.RESISTOR 1/4W 301	1	
R76		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R77		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R78		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R79		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R80		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R81,82		ERDS2TJ681	C.RESISTOR 1/4W 680	2	
R83,84		ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R85		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R86		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R87,88		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R89		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R90		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R91,92		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R93		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R94,95		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R97,98		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R99		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R100,01		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R102		EXBF5E681J	COMBI R-R 680	1	
R103,04		ERJ6GEYJ150	M.RESISTOR CH1/16W 15	2	
R105,06		EROS2CHF3321	M.RESISTOR 1/4W 3.32K	2	
R107		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R109		ERSA22G222	M.RESISTOR 2.2K	1	
R111,12		ERDS2TJ681	C.RESISTOR 1/4W 680	2	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R113		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R114-16		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R117		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R118-22		ERDS2TJ103	C.RESISTOR 1/4W 10K	5	
R123		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R124,25		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R126		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R127		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R128		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R129		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R130		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R132		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R133,34		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R135,36		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R137,38		ERDS2TJ333	C.RESISTOR 1/4W 33K	2	
R139,40		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R142		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R143		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R144		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R145		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R146,47		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R148		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R149		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R150		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R151		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R152		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R154		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R155		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R156,57		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R158		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R159		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R160		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R161		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R163		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R164		ERN55EC5300	METAL 1/4W,1/8W 530	1	
R165		ERN55EC2130	METAL 1/4W,1/8W 213	1	
R166		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R168		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R169		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	ON VEP83063A
R169		ERDS2TJ333	C.RESISTOR 1/4W 3.3K	1	ON VEP83063B
R170		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R171		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R172		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R173		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R174		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R175		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R176		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R177		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R178		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R179		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R180		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R181		EROS2CHF3320	M.RESISTOR 1/4W 332	1	
R182		EROS2CHF1001	M.RESISTOR 1/4W 1K	1	
R183		EROS2CHD8250	M.RESISTOR 1/4W 825	1	
R184		EROS2CHD1820	M.RESISTOR 1/4W 182	1	
R185	-	EROS2CHD4020	M.RESISTOR 1/4W 402	1	
R186		EROS2CHD1001	M.RESISTOR 1/4W 1K	1	
R187		EROS2CKF4701	M.RESISTOR 1/4W 4.7K	1	
R188		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R189		EROS2CKF2101	C.RESISTOR 1/4W 2.1K	1	
R190		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R191		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R192		EROS2CHD2212	M.RESISTOR 1/4W 22.1K	1	
R193		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R194		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R195		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R196,97		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R198		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R199,00		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R201		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R202		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R203,04		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R205		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R206,07		EROS2CHF1470	M.RESISTOR 1/4W 147	2	
R208,09		ERDS2TJ681	C.RESISTOR 1/4W 680	2	
R210		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R211,12		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R213		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R214		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R215,16		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R217,18		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R219		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R220		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R221		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R222		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R223		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R224		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R225		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R226		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R227-30		ERDS2TJ102	C.RESISTOR 1/4W 1K	4	
R231,32		ERDS2TJ154	C.RESISTOR 1/4W 150K	2	
R233,34		ERDS2TJ683	C.RESISTOR 1/4W 68K	2	
R235,36		ERDS2TJ471	C.RESISTOR 1/4W 470	2	
R237,38		ERDS2TO	C.RESISTOR 1/4W 0	2	
R239		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R240		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R241		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R242-44		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R245		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R246		ERG1ANJP270	M.RESISTOR 1W 27	1	
R247		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R248		ERSA18G332	M.RESISTOR 1/8W 3.3K	1	
R249		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R250		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R251		ERDS2TO	C.RESISTOR 1/4W 0	1	
R252		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	ON VEP83063A
R252		ERDS2TJ333	C.RESISTOR 1/4W 3.3K	1	ON VEP83063B
R253,54		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R255,56		ERDS2TJ153	C.RESISTOR 1/4W 15K	2	
R257,58		ERDS2TJ225	C.RESISTOR 1/4W 2.2M	2	
R259		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R260,61		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R262		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R263,64		EROS2CHF5900	M.RESISTOR 1/4W 590	2	
R265		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R266,67		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R268,69		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R1001		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R1002		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R1003		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R1004		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R2001		EROS2CHF3160	M.RESISTOR 1/4W 316	1	
R2002		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
RA96		EXBF7E681J	COMBI R-R 680	1	
RA102		EXBF5E681J	COMBI R-R 680	1	
RA141		EXBF7E681J	COMBI R-R 680	1	
SW1-W7		VJP1563	CONNECTOR(MALE)	7	
TP1-P9		VJR0138Y	TEST POINT	9	
TP10-19		VJR0138Y	TEST POINT	10	
TPG1-G5		VJR0138B	TEST POINT	5	
VR1,R2		VRV0063B301	V.RESISTOR 300	2	
VR3,R4		VRV0063B101	V.RESISTOR 100	2	
VR5		VRV0063B202	V.RESISTOR 2K	1	
VR6		VRV0063B502	V.RESISTOR 5K	1	
VR7		VRV0063B102	V.RESISTOR 1K	1	
VR8		VRV0063B501	V.RESISTOR 500	1	
VR9		VRV0085B203	V.RESISTOR 20K	1	
VR10		VRV0063B501	V.RESISTOR 500	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR11-16		VRV0063B502	V.RESISTOR 5K	6	
VR17		VRV0063B102	V.RESISTOR 1K	1	
VR18		VRV0063B501	V.RESISTOR 500	1	
VR19		VRV0063B203	V.RESISTOR 20K	1	
VR20		VRV0063B102	V.RESISTOR 1K	1	
VR21		VRV0063B501	V.RESISTOR 500	1	
VR22,23		VRV0063B203	V.RESISTOR 20K	2	
VR24		VRV0063B102	V.RESISTOR 1K	1	
VR25		VRV0063B204	V.RESISTOR 200K	1	
VR26		VRV0063B502	V.RESISTOR 5K	1	
VR27		VRV0063B103	V.RESISTOR 10K	1	
VR28		VRV0063B501	V.RESISTOR 500	1	
VR29		VRV0063B104	VARIABLE RESISTOR 100K	1	
			MISCELLANEOUS		
		VJR0085	PIN	5	
		VJS1563	SOCKET	6	
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VXA2247	P.C.B. SIELD PLATE	2	
		XYNV3+K6FR	SCREW	6	
	■	VEP80442A	P.C.BOARD W/COMPONENT		PART OF VEP83063A,B
			Y PB SUB 1		
C1001		ECKF1H103ZF	C.CAPASITOR 50V 0.01U	1	
C1002		ECKF1H103ZF	C.CAPASITOR 50V 0.01U	1	
C1003		ECQV1H104JZ	P.CAPASITOR 50V 0.1U	1	
C1004		ECQV1H104JZ	P.CAPASITOR 50V 0.1U	1	
C1005		ECQV1H224JZ	P.CAPASITOR 50V 0.22U	1	
IC1001		MC1330A1P	IC	1	
R1001		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R1002		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R1003		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R1004		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
			MISCELLANEOUS		
		VJR0422	PIN	3	
	■	VEP80451A	P.C.BOARD W/COMPONENT		PART OF VEP83063A,B
			Y PB SUB 2		
			CAPACITORS		
C1		ECQP1H271JZ	P.CAPACITOR 50V 270P	1	
L1		VLQEL06F1R2J	COIL 1.2UH	1	
			RESISTORS		
R1		ERDS2TJ270	C.RESISTOR 1/4W 27	1	
R2		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R3		ERDS2TJ220	C.RESISTOR 1/4W 22	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP80453A	P.C.BOARD W/COMPONENT		PART OF VEP83063A
			Y PB SUB3		
			CAPACITORS		
C2		ECQP1H821JZ	P.CAPACITOR 50V 820P	1	
L1		VLQEL05F1R0J	COIL 1.0UH	1	
L2		VLQEL05F2R2J	COIL 2.2UH	1	
			RESISTORS		
R1		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R2		ERDS2TJ180	C.RESISTOR 1/4W 18	1	
			MISCELLANEOUS		
		VJR0422	PIN	2	
	■	VEP80491A	P.C.BOARD W/COMPONENT		
			Y PB SUB 4		
			CAPACITORS		
C2001		ECCF1H390JC	C.CAPACITOR 50V 39P	1	
C2002		ECQP1H361JZ	P.CAPACITOR 50V 360P	1	
L2001		EIR7QF016B	COIL H	1	
L2002		VLQEL06F3R3J	COIL 3.3UH	1	
			RESISTORS		
R2001		EROS2CHF3160	M.RESISTOR 1/4W 316	1	
R2002		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
			MISCELLANEOUS		
		VJR0421	PIN	4	
	■	VEP80501A	P.C.BOARD W/COMPONENT		PART OF VEP83063A,B
			AUTO EQ SUB		
D3001		MA165	DIODE	1	
IC3001		MPD4053BC	IC	1	
R3001		ERDS2TJ154	C.RESISTOR 1/4W 150K	1	
R3002		ERDS2TJ154	C.RESISTOR 1/4W 150K	1	
R3003		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R3004		ERDS2TJ154	C.RESISTOR 1/4W 150K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR3001		VRV0109B204	V.RESISTOR 1/4W 200K	1	
VR3002		VRV0109B104	V.RESISTOR 100K	1	
VR3025		VRV0109B204	V.RESISTOR 1/4W 200K	1	
			MISCELLANEOUS		
		VJR0422	PIN	4	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP84071A S5 PB AMP & FM AUDIO

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP84071A	P.C.BOARD W/COMPONENT		
S5			PB AMP & FM AUDIO		
			CAPACITORS		
C1		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C2		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C3		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C4		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C5		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C6		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C7		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C8		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C9		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C10		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C11		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C12		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C13		ECCF1H040CC	C.CAPACITOR 50V 4P	1	
C14,15		ECCF1H390JC	C.CAPACITOR 50V 39P	2	
C16		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C16		ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1	
C17,18		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C19		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C20		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C21,22		ECEA1HU010	E.CAPACITOR 50V 1U	2	
C23		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C24-26		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C27		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C28		ECQP1H121JZ	P.CAPACITOR 50V 120P	1	
C29-35		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	7	
C36,37		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C38,39		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C40		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C41		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C42,43		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C44		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C45,46		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C47,48		ECEA1HU010	E.CAPACITOR 50V 1U	2	
C49		ECEA0JU471	E.CAPACITOR 6.3V 470U	1	
C101		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C102		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C103		ECQM1H152JV	P.CAPACITOR 50V 1500P	1	
C104		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C105		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C106		ECEA1HN3R3S	E.CAPACITOR 50V 3.3U	1	
C107		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C108		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C109		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C110		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C111		ECEA0JN470S	E.CAPACITOR 6.3V 47U	1	
C112		ECEA0JN101S	E.CAPACITOR 6.3V 100U	1	
C113		ECEA16Z10	E.CAPACITOR 16V 10U	1	
C114		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C115		ECEA16Z10	E.CAPACITOR 16V 10U	1	
C116		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C117,18		ECEA1CU470	E.CAPACITOR 16V 47U	2	
C119-21		ECEA1CU101	E.CAPACITOR 16V 100U	3	
C122		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C123,24		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C125		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C126,27		ECEA1EN100S	E.CAPACITOR 25V 10U	2	
C128		ECQM1H182JV	P.CAPACITOR 50V 1800P	1	
C129		ECQP1H821JZ	P.CAPACITOR 50V 820P	1	
C130		ECEA1EN470S	E.CAPACITOR 25V 47U	1	
C131		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C132		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	1	
C301		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C302		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C303		ECQM1H152JV	P.CAPACITOR 50V 1500P	1	
C304		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C305		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C306		ECEA1HN3R3S	E.CAPACITOR 50V 3.3U	1	
C307		ECEA1CU470	E.CAPACITOR 16V 47U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C308		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C309		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C310		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C311		ECEA0JN470S	E.CAPACITOR 6.3V 47U	1	
C312		ECEA0JN101S	E.CAPACITOR 6.3V 100U	1	
C313		ECEA16Z10	E.CAPACITOR 16V 10U	1	
C314		ECQM1H223JV	P.CAPACITOR 50V 0.022U	1	
C315		ECEA16Z10	E.CAPACITOR 16V 10U	1	
C316		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C317,18		ECEA1CU470	E.CAPACITOR 16V 47U	2	
C319-21		ECEA1CU101	E.CAPACITOR 16V 100U	3	
C322		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C323,24		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C325		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C326,27		ECEA1EN100S	E.CAPACITOR 25V 10U	2	
C328		ECQM1H182JV	P.CAPACITOR 50V 1800P	1	
C329		ECQP1H821JZ	P.CAPACITOR 50V 820P	1	
C330		ECEA1EN470S	E.CAPACITOR 25V 47U	1	
C331		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C332		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	1	
C501		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C502,03		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C505,06		ECKF1H271KB	C.CAPACITOR 50V 270P	2	
C507,08		ECKF1H151KB	C.CAPACITOR 50V 150P	2	
C509-12		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C513		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C514		ECKF1H391KB	C.CAPACITOR 50V 390P	1	
C515		ECQV1H564JZ	P.CAPACITOR 50V 0.56U	1	
C516		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C517		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C518		ECKF1H391KB	C.CAPACITOR 50V 390P	1	
C519		ECQV1H564JZ	P.CAPACITOR 50V 0.56U	1	
C520		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C525		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C526,27		ECQM1H103JV	P.CAPACITOR 50V 0.01U	2	
C528		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C529,30		ECQM1H103JV	P.CAPACITOR 50V 0.01U	2	
C531		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C532		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C533		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C534		ECEA1HU3R3	E.CAPACITOR 50V 3.3U	1	
C535		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C536		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C537		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
D1-D4		MA165	DIODE	4	
D6		MA1030	ZENER DIODE	1	
D101,02		OA95	DIODE	2	
D301,02		OA95	DIODE	2	
D501,02		MA165	DIODE	2	
D505,06		MA165	DIODE	2	
D509-14		MA165	DIODE	6	
FL1		VLF0545	FILTER	1	
FL501,02		ELB4M043	FILTER	2	
FL503,04		ELB41053	FILTER	2	
IC1		AN6330	IC	1	
IC2		AN6330	IC	1	
IC3		AN6308	IC	1	
IC4		UPC393C	IC	1	
IC5		AN78N05	IC	1	
IC101		VEP80443A	P.C.BOARD W/COMPONENT	1	
IC102,03		UPC4558C	IC	2	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC301		VEP80443A	P.C.BOARD W/COMPONENT	1	
IC302,03		UPC4558C	IC	2	
IC501,02		AN3920K	IC	2	
IC503		SN74LS74AN	IC	1	
IC504		MC14066BCP	IC	1	
IC505		UPC319C	IC	1	
L1		VLQ0242	COIL 30UH	1	
L2		VLQEL06F101K	COIL 100UH	1	
L3		EIR7QF015B	COIL	1	
L4		VLQEL06F2R2K	COIL 2.2UH	1	
L5		VLQEL06F3R9K	COIL 3.9UH	1	
L6		VLQEL06F101K	COIL 100UH	1	
L7		EIR7QF016B	COIL	1	
L8		VLQEL06F3R9K	COIL 3.9UH	1	
L9		VLQEL06F101K	COIL 100UH	1	
L101		VLQEL06F101K	COIL 100UH	1	
L301		VLQEL06F101K	COIL 100UH	1	
L501		VLQEL06F101K	COIL 100UH	1	
L502,03		VLQEL06F221K	COIL 220UH	2	
L504		VLQEL06F101K	COIL 100UH	1	
Q1,Q2		2SC2206	TRANSISTOR	2	(B,C)
Q3		2SC2188	TRANSISTOR	1	
Q4,Q5		2SC2206	TRANSISTOR	2	(B,C)
Q6		2SC2188	TRANSISTOR	1	
Q7,Q8		2SC2206	TRANSISTOR	2	(B,C)
Q9		2SC2188	TRANSISTOR	1	
Q10,11		2SC2188	TRANSISTOR	2	
Q12		2SC2377	TRANSISTOR	1	
Q13		2SC2188	TRANSISTOR	1	
Q14		2SC2377	TRANSISTOR	1	
Q15		2SC2188	TRANSISTOR	1	
Q101		2SD638	TRANSISTOR	1	(Q,R)
Q102		2SB643	TRANSISTOR	1	(Q,R)
Q103		UN1113	TRANSISTOR-RESISTOR	1	
Q104		2SD1330	TRANSISTOR	1	
Q105,06		2SD636	TRANSISTOR	2	(Q,R)
Q301		2SD638	TRANSISTOR	1	(Q,R)
Q302		2SB643	TRANSISTOR	1	(Q,R)
Q303		UN1113	TRANSISTOR-RESISTOR	1	
Q304		2SD1330	TRANSISTOR	1	
Q305,06		2SD636	TRANSISTOR	2	(Q,R)
Q503,04		2SC2206	TRANSISTOR	2	(B,C)
Q505		DTC144EA	TRANSISTOR RESISTOR	1	OR UN1213
Q506-09		2SC2206	TRANSISTOR	4	(B,C)
Q510		UN1111	TRANSISTOR-RESISTOR	1	
Q511,12		DTC144EA	TRANSISTOR RESISTOR	2	OR UN1213
Q513,14		DTC114TA	TRANSISTOR-RESISTOR	2	
Q515		2SB641	TRANSISTOR	1	(Q,R)
Q516		2SD636	TRANSISTOR	1	(Q,R)
			RESISTORS		
R1		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R2		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R3		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R4		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R5		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R6		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R7		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R8		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R9		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R10		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R11		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R12		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R13		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R14		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R15		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R16		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R17		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R18		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R19,20		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R21		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R22,23		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R24		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R25,26		ERDS2TJ821	C.RESISTOR 1/4W 820	2	
R27		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R28		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R29		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R30		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R31		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R32,33		ERDS2TJ470	C.RESISTOR 1/4W 47	2	
R34		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R35		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R36		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R37		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R38		ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R39		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R40		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R41-43		ERDS2TJ470	C.RESISTOR 1/4W 47	3	
R47		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R48		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R49		ERDS2TJ680	C.RESISTOR 1/4W 68	1	
R50,51		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R52,53		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R54		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R55		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R56		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R57		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R58		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R59		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R60		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R61		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R62		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R65		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R66		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R67		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R68		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R69		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R70		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R71		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R72		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R73		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R78		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R101		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R102		EROS2CKG6801	M.RESISTOR 1/4W 6.8K	1	
R103		EROS2CKG3301	M.RESISTOR 1/4W 3.3K	1	
R104		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R105		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R106		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R107		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R108		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R109		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R110		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R111,12		EROS2CKG3301	M.RESISTOR 1/4W 3.3K	2	
R113		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R114		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R115		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R116		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R117		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R118		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R119		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R120		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R121,22		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R123		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R124		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R301		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R302		EROS2CKG6801	M.RESISTOR 1/4W 6.8K	1	
R303		EROS2CKG3301	M.RESISTOR 1/4W 3.3K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R304		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R305		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R306		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R307		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R308		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R309		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R310		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R311,12		EROS2CKG3301	M.RESISTOR 1/4W 3.3K	2	
R313		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R314		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R315		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R316		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R317		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R318		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R319		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R320		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R321,22		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R323		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R324		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R507-12		ERDS2TJ102	C.RESISTOR 1/4W 1K	6	
R513,14		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	2	
R515,16		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
R517		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R518		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R519		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R520		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R521		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R522		ERDS2TJ273	C.RESISTOR 1/4W 27K	1	
R523		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R524-26		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R527		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R528		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R529		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R530		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R531		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R532		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R533		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R534		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R535		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R536		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R537		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R538		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R539		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R540		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R541		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R542		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R543		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R544		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R545,46		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R547		ERDS2TJ274	C.RESISTOR 1/4W 270K	1	
R548		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R549		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R550		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R551		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
SW1-W6		VJP1990	CONNECTOR	6	
SW501		VJP1990	CONNECTOR	1	
SW2S		VJS1990	CONNECTOR	1	
SW3S		VJS1990	CONNECTOR	1	
SW5S		VJS1990	CONNECTOR	1	
SW6S		VJS1990	CONNECTOR	1	
SW501S		VJS1990	CONNECTOR	1	
TP1-P7		VJR0400Y	TEST POINT	7	
TP201-03		VJR0400Y	TEST POINT	3	
TP301-03		VJR0400Y	TEST POINT	3	
TP501-06		VJR0400Y	TEST POINT	6	
TPG1-G4		VJR0400B	TEST POINT	4	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR1,R2		VRV0109B301	V.RESISTOR 300	2	
VR3		VRV0109B101	V.RESISTOR 100	1	
VR4		VRV0109B501	V.RESISTOR 500	1	
VR201,02		VRV0109B502	V.RESISTOR 5K	2	
VR203		VRV0109B202	V.RESISTOR 2K	1	
VR204		VRV0109B203	V.RESISTOR 20K	1	
VR205		VRV0109B103	V.RESISTOR 10K	1	
VR301,02		VRV0109B502	V.RESISTOR 5K	2	
VR303		VRV0109B202	V.RESISTOR 2K	1	
VR304		VRV0109B203	V.RESISTOR 20K	1	
VR305		VRV0109B103	V.RESISTOR 10K	1	
VR501,02		VRV0109B103	V.RESISTOR 10K	2	
			MISCELLANEOUS		
		VSC2530	SHIELD CASE	1	
		VSC2862	SHIELD CASE	1	
		VSC2863	SHIELD CASE	1	
	■	VEP80443A	P.C.BOARD W/COMPONENT		PART OF VEP84071A
			FM AUDIO SUB		
			CAPACITORS		
C1		ECUM1H222JM	C.CAPACITOR CH 50V 2200P	1	
C2		ECUM1H102JN	C.CAPACITOR CH 50V 1000P	1	
C3		ECUM1H222JM	C.CAPACITOR CH 50V 2200P	1	
C4		ECUX1H821JN	C.CAPACITOR CH 50V 820P	1	
C5		ECUX1H182JN	C.CAPACITOR 50V 1800P	1	
C6		ECUM1H222KBN	C.CAPACITOR CH 50V 2200P	1	
C7		ECUX1H821JN	C.CAPACITOR CH 50V 820P	1	
C8		ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
C9		ECUX1H392KBN	C.CAPACITOR CH 50V 3900P	1	
C10		ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
C11		ECUM1H561JCN	C.CAPACITOR CH 50V 560P	1	
C12		ECUM1H272KBN	C.CAPACITOR CH 50V 2700P	1	
C13		ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
C15		ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
IC1		AN6298NS	IC	1	
IC2		AN3922NS	IC	1	
			RESISTORS		
R1		ERJ6GEYG562	M.RESISTOR CH 1/10W 5.6K	1	
R2		ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R3		ERJ6GEYG912	M.RESISTOR CH 1/10W 9.1K	1	
R4		ERJ6GEYG163	M.RESISTOR CH 1/10W 16K	1	
R5		ERJ6GEYG332	M.RESISTOR CH 1/10W 3.3K	1	
R6		ERJ6GEYG112	M.RESISTOR CH 1/10W 1.1K	1	
R7		ERJ6GEYG103	M.RESISTOR CH 1/10W 10K	1	
R8		ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R9		ERJ6GEYG183	M.RESISTOR CH 1/10W 18K	1	
R10		ERJ6GEYG562	M.RESISTOR CH 1/10W 5.6K	1	
R11-14		ERJ6GEYG332	M.RESISTOR CH 1/10W 3.3K	4	
R15		ERJ6GEYG472	M.RESISTOR CH 1/10W 4.7K	1	
R16		ERJ6GEYG102	M.RESISTOR CH 1/10W 1K	1	
R17		ERJ6GEYG123	M.RESISTOR CH 1/10W 12K	1	
R18		ERJ6GEYG473	M.RESISTOR CH 1/10W 47K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP84070A   S6 AUDIO 1

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP84070A	P.C.BOARD W/COMPONENT		
S6			AUDIO 1		
			CAPACITORS		
C1		ECQB1H153JZ	P.CAPACITOR 50V 0.015U	1	
C2		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C3		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C4		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C101		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C102		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C103		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C104,05		ECEA1CU221	E.CAPACITOR 16V 220U	2	
C106		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C107		ECQM1H473JV	P.CAPACITOR 50V 0.047U	1	
C108		ECEA1CN220S	E.CAPACITOR 16V 22U	1	
C109		ECQM1H562JV	P.CAPACITOR 50V 5600P	1	
C110		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C111		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C112		ECQP1H103FZ	P.CAPACITOR 50V 0.01U	1	
C113		ECQP1H472FZ	P.CAPACITOR 50V 4700P	1	
C114		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C115		ECQM1H473JV	P.CAPACITOR 50V 0.047U	1	
C116		ECEA50ZR22	E.CAPACITOR 50V 0.22U	1	
C117		ECEA50ZR68	E.CAPACITOR 50V 0.68U	1	
C118		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C119		ECQP1H472FZ	P.CAPACITOR 50V 4700P	1	
C120		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C121		ECQM1H473JV	P.CAPACITOR 50V 0.047U	1	
C122		ECEA50ZR22	E.CAPACITOR 50V 0.22U	1	
C123		ECEA50ZR68	E.CAPACITOR 50V 0.68U	1	
C124		ECEA1AU221	E.CAPACITOR 10V 220U	1	
C125		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C126,27		ECEA1CN100S	E.CAPACITOR 16V 10U	2	
C128		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C129-31		ECEA1CN100S	E.CAPACITOR 16V 10U	3	
C132		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C133		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	1	
C134		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C135		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C136		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C137		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C138		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C139,40		ECQV1H394JZ	P.CAPACITOR 50V 0.39U	2	
C301		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C302		ECCF1H820JC	C.CAPACITOR 50V 82P	1	
C303		ECCF1H151JC	C.CAPACITOR 50V 150P	1	
C304,05		ECEA1CU221	E.CAPACITOR 16V 220U	2	
C306		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C307		ECQM1H473JV	P.CAPACITOR 50V 0.047U	1	
C308		ECEA1CN220S	E.CAPACITOR 16V 22U	1	
C309		ECQM1H562JV	P.CAPACITOR 50V 5600P	1	
C310		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C311		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C312		ECQP1H103FZ	P.CAPACITOR 50V 0.01U	1	
C313		ECQP1H472FZ	P.CAPACITOR 50V 4700P	1	
C314		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C315		ECQM1H473JV	P.CAPACITOR 50V 0.047U	1	
C316		ECEA50ZR22	E.CAPACITOR 50V 0.22U	1	
C317		ECEA50ZR68	E.CAPACITOR 50V 0.68U	1	
C318		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C319		ECQP1H472FZ	P.CAPACITOR 50V 4700P	1	
C320		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C321		ECQM1H473JV	P.CAPACITOR 50V 0.047U	1	
C322		ECEA50ZR22	E.CAPACITOR 50V 0.22U	1	
C323		ECEA50ZR68	E.CAPACITOR 50V 0.68U	1	
C324		ECEA1AU221	E.CAPACITOR 10V 220U	1	
C325		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C326,27		ECEA1CN100S	E.CAPACITOR 16V 10U	2	
C328		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C329-31		ECEA1CN100S	E.CAPACITOR 16V 10U	3	
C332		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C333		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	1	
C334		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C335		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C336		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C337		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C338		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C339,40		ECQV1H394JZ	P.CAPACITOR 50V 0.39U	2	
C501		ECEA1CU330	E.CAPACITOR 16V 33U	1	
C502		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C503		ECCF1H560JC	C.CAPACITOR 50V 56P	1	
C504		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C505		ECEA0JU331	E.CAPACITOR 6.3V 330U	1	
C506		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C507,08		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C509		ECEA1EN4R7S	E.CAPACITOR 25V 4.7U	1	
C510		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C511		ECCF1H150JC	C.CAPACITOR 50V 15P	1	
C512		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C513		ECEA1EN220S	E.CAPACITOR 25V 22U	1	
C514,15		ECEA1CU470	E.CAPACITOR 16V 47U	2	
C516		ECEA1EN4R7S	E.CAPACITOR 25V 4.7U	1	
C517		ECQB1H183JZ	P.CAPACITOR 50V 0.018U	1	
C518,19		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C520		ECEA1EN220S	E.CAPACITOR 25V 22U	1	
C521-24		ECEA1CU101	E.CAPACITOR 16V 100U	4	
D1-D4		MA165	DIODE	4	
D101,02		OA95	DIODE	2	
D103		MA165	DIODE	1	
D301,02		OA95	DIODE	2	
D303		MA165	DIODE	1	
D501,02		MA165	DIODE	2	
FL101		EIR7QH002B	FILTER	1	
FL102		VLF0427	FILTER	1	
FL103		ELM7Q306A	COIL	1	
FL104		VLF0427	FILTER	1	
FL301		EIR7QH002B	FILTER	1	
FL302		VLF0427	FILTER	1	
FL303		ELM7Q306A	COIL	1	
FL304		VLF0427	FILTER	1	
IC101		AN6558	IC	1	
IC102		UPC4558C	IC	1	
IC103		TEA0666T	IC	1	
IC104		AN6558	IC	1	
IC105,06		UPC4558C	IC	2	
IC107		MN6631A	IC	1	
IC301		AN6558	IC	1	
IC302		UPC4558C	IC	1	
IC303		TEA0666T	IC	1	
IC304		AN6558	IC	1	
IC305,06		UPC4558C	IC	2	
IC307		MN6631A	IC	1	
IC501		BA301	IC	1	
IC502,03		LM318N	IC	2	
IC504		MN6631A	IC	1	
IC505		LM318N	IC	1	
Q1-Q7		DTC144EA	TRANSISTOR RESISTOR	7	OR UN1213
Q8		2SB641	TRANSISTOR	1	(Q,R)
Q9		DTC144EA	TRANSISTOR RESISTOR	1	OR UN1213
Q10,11		DTC144EA	TRANSISTOR RESISTOR	2	OR UN1213
Q101		2SK146	TRANSISTOR	1	
Q102,03		DTC144EA	TRANSISTOR RESISTOR	2	OR UN1213
Q104		2SD1330	TRANSISTOR	1	
Q105		2SB641	TRANSISTOR	1	(Q,R)
Q106		2SD636	TRANSISTOR	1	(Q,R)

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
Q107	2SD1330	TRANSISTOR	1	
Q108	2SD638	TRANSISTOR	1	(Q,R)
Q109	2SB643	TRANSISTOR	1	(Q,R)
Q110	DTC144EA	TRANSISTOR RESISTOR	1	OR UN1213
Q301	2SK146	TRANSISTOR	1	
Q302,03	DTC144EA	TRANSISTOR RESISTOR	2	OR UN1213
Q304	2SD1330	TRANSISTOR	1	
Q305	2SB641	TRANSISTOR	1	(Q,R)
Q306	2SD636	TRANSISTOR	1	(Q,R)
Q307	2SD1330	TRANSISTOR	1	
Q308	2SD638	TRANSISTOR	1	(Q,R)
Q309	2SB643	TRANSISTOR	1	(Q,R)
Q310	DTC144EA	TRANSISTOR RESISTOR	1	OR UN1213
Q501,02	DTC144EA	TRANSISTOR RESISTOR	2	OR UN1213
Q503	2SD638	TRANSISTOR	1	(Q,R)
Q504	2SB643	TRANSISTOR	1	(Q,R)
		RESISTORS		
R1-R9	ERDS2TJ103	C.RESISTOR 1/4W 10K	9	
R10	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R11,12	ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R13	ERDS2TJ274	C.RESISTOR 1/4W 270K	1	
R101	ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R102,03	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	2	
R104	ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R105	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R106	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R107	ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R108	ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R109,10	ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R111,12	ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R113-15	ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R116	ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R117	ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R118	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R119	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R120	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R121	EROS2TKF5101	M.RESISTOR 1/4W 5.1K	1	
R122	EROS2TKF6802	M.RESISTOR 1/4W 68K	1	
R123	EROS2TKF2201	M.RESISTOR 1/4W 2.2K	1	
R124	EROS2TKF8202	M.RESISTOR 1/4W 82K	1	
R125	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R126	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R127	EROS2CKF1001	M.RESISTOR 1/4W 1K	1	
R128	EROS2CKF3301	M.RESISTOR 1/4W 3.3K	1	
R129	ERDS2TO	C.RESISTOR 1/4W 0	1	
R130	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R131	EROS2TKF8202	M.RESISTOR 1/4W 82K	1	
R132	EROS2CKF3302	M.RESISTOR 1/4W 33K	1	
R133-36	ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R137	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R138	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R139	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R140	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R141	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R142	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R143	ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R144	ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R145	ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R146	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R147	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R148	ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R149	ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R150	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R151	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R152	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R153	ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R154	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R155	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R156-58	ERDS2TJ473	C.RESISTOR 1/4W 47K	3	
R159,60	ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R162	ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R163	EROS2CHG2002	M.RESISTOR 1/4W 20K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R301	ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R302,03	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	2	
R304	ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R305	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R306	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R307	ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R308	ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R309,10	ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R311,12	ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R313-15	ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R316	ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R317	ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R318	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R319	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R320	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R321	EROS2TKF5101	M.RESISTOR 1/4W 5.1K	1	
R322	EROS2TKF6802	M.RESISTOR 1/4W 68K	1	
R323	EROS2TKF2201	M.RESISTOR 1/4W 2.2K	1	
R324	EROS2TKF8202	M.RESISTOR 1/4W 82K	1	
R325	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R326	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R327	EROS2CKF1001	M.RESISTOR 1/4W 1K	1	
R328	EROS2CKF3301	M.RESISTOR 1/4W 3.3K	1	
R329	ERDS2TO	C.RESISTOR 1/4W 0	1	
R330	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R331	EROS2TKF8202	M.RESISTOR 1/4W 82K	1	
R332	EROS2CKF3302	M.RESISTOR 1/4W 33K	1	
R333-36	ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R337	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R338	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R339	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R340	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R341	ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R342	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R343	ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R344	ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R345	ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R346	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R347	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R348	ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R349	ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R350	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R351	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R352	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R353	ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R354	ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R355	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R356-58	ERDS2TJ473	C.RESISTOR 1/4W 47K	3	
R359,60	ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R362	ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R363	EROS2CHG2002	M.RESISTOR 1/4W 20K	1	
R501,02	ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R503	ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R504	ERDS2TJ154	C.RESISTOR 1/4W 150K	1	
R505	ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R506	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R507	ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R508	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R509	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R510	ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R511	ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R512	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R513	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R514	ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R515	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R516	ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R517	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R518	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R519	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R520	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R521	ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R522	ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R523	ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R524	ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R525	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R526,27		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R529		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R530		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R531		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
SW101		VSS023703	SWITCH	1	
SW301		VSS023703	SWITCH	1	
TP101-03		VJR0400Y	TEST POINT	3	
TP301-03		VJR0400Y	TEST POINT	3	
TP501-03		VJR0400Y	TEST POINT	3	
TPG101		VJR0400B	TEST POINT	1	
TPG301		VJR0400B	TEST POINT	1	
TPG501		VJR0400B	TEST POINT	1	
VR101,02		VRV0109B502	V.RESISTOR 5K	2	
VR103-06		VRV0109B103	V.RESISTOR 10K	4	
VR107		VRV0109B203	V.RESISTOR 20K	1	
VR301,02		VRV0109B502	V.RESISTOR 5K	2	
VR303-06		VRV0109B103	V.RESISTOR 10K	4	
VR307		VRV0109B203	V.RESISTOR 20K	1	
			MISCELLANEOUS		
		VJF0300	BINDER	2	
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VXA2247	P.C.B.SHIELD PLATE	1	

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VEP82034D S9 AT

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP82034D	P.C.BOARD W/COMPONENT		
S9			AT		
			CAPACITORS		
C1		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C2		ECKF1H472KB	C.CAPACITOR 50V 4700P	1	
C3		ECQP1471JZ	P.CAPACITOR 100V 470P	1	
C4		ECQP1102JZ	P.CAPACITOR 100V 1000P	1	
C5,C6		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C7,C8		ECQM1H122JV	P.CAPACITOR 50V 1200P	2	
C9		ECKF1H101KB	C.CAPACITOR 50V 100P	1	
C10		ECQM1H104JV	P.CAPACITOR 50V 0.1U	1	
C11		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C12		ECEA1CSN4R7	E.CAPACITOR 16V 4.7U	1	
C14		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C15		ECQM1H682JV	P.CAPACITOR 50V 6800P	1	
C16,17		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C19-23		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C24,25		ECQP1H151JZ	P.CAPACITOR 50V 150U	2	
C26-28		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C29		ECEA1CKS220	E.CAPACITOR 16V 22U	1	
C30-36		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	7	
C37		ECCF1H180JC	C.CAPACITOR 50V 18P	1	
C38		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C42		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C49		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C50,51		ECEA1EKS330	E.CAPACITOR 25V 33U	2	
C52,53		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C54,55		ECEA1EKS330	E.CAPACITOR 25V 33U	2	
C56		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C66		ECEA1HUR33	E.CAPACITOR 50V 0.33U	1	
C67		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C68-71		ECEA1CKS330	E.CAPACITOR 16V 33U	4	
C72-77		ECEA1EKS330	E.CAPACITOR 25V 33U	6	
C78		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C79		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C80		ECEA1HU470	E.CAPACITOR 50V 47U	1	
C81-86		ECWH1CH103	C.CAPACITOR 50V 0.01U	6	
C105		ECEA1CKS330	E.CAPACITOR 16V 33U	1	
C106,07		ECCD2H331J2	C.CAPACITOR 500V 330P	2	
C108,09		ECEA1HU470	E.CAPACITOR 50V 47U	2	
C111		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C112		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C113		ECQP1H151JZ	P.CAPACITOR 50V 150U	1	
C114		ECEA1HN010SB	E.CAPACITOR 50V 1U	1	
C115,16		ECEA1EKS330	E.CAPACITOR 25V 33U	2	
C120		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C121		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
C122		ECCF1H181JC	C.CAPACITOR 50V 180P	1	
D1-D4		MA165	DIODE	4	
D6		MA165	DIODE	1	
D7		MA156	DIODE	1	
D9		10E1FA8	DIODE	1	
D10		10E1FA8	DIODE	1	
D22,23		ER2C07DK361B	SURGE ABSORBER 360V	2	
D24-26		LN25RP	LED	3	
D30,31		1SS101	DIODE	2	
D32-35		MA156	DIODE	4	
D36-43		MA165	DIODE	8	
D44		RD8.2EB2	ZENER 8.2V	1	
D45,46		MA165	DIODE	2	
D47,48		RC2	DIODE	2	
D50		MA165	DIODE	1	
D51		MA154WA	DIODE	1	
D52		MA165	DIODE	1	
IC1		UPC4074G	IC	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
IC3	UPC393G	IC	1	<R>
IC11	MC74HC4538F	IC	1	
IC12,13	MC74HC74F	IC	2	
IC14	MC74HC00F	IC	1	
IC15,16	MC74HC08F	IC	2	
IC17,18	HD74HC193FP	IC	2	
IC19	MC74HC273F	IC	1	
IC20	AN608P	IC	1	
IC21	TL431CLPB	IC	1	
IC22	UPC4741G	IC	1	
IC23	UPC4558G	IC	1	
IC24	UPC4082G	IC	1	
IC25	MN18882	IC	1	
IC26	VSI0322	IC	1	
IC27	M51951BML	IC	1	
IC30,31	MC74HC157F	IC	2	
IC40,41	VCR0111	IC	2	
IC42	MC74HC74F	IC	1	
IC43-45	MC74HC595F	IC	3	
IC48-50	UPC358G	IC	3	
IC51	UPC393G	IC	1	<R>
IC52	UPD4053BG	IC	1	
IC53	MC74HC4040F	IC	1	
IC80	MC74HC04F	IC	1	
IC81	AN78L05	IC	1	
L1-L7	VLQEL05F101J	COIL 100UH	7	
L10	VLQ0128	COIL 47UH	1	
L11	VLQEL05F101J	COIL 100UH	1	
L15	VLQ0128	COIL 47UH	1	
L16-19	VLQEL07F222J	COIL 2200UH	4	
P1,P2	VJP1150	CONNECTOR(MALE)	2	
P3	VJS2351	CONNECTOR	1	
P4	VJS2352	CONNECTOR	1	
Q1	2SK128	TRANSISTOR	1	
Q3	2SK128	TRANSISTOR	1	
Q4	UN1113	TRANSISTOR-RESISTOR	1	
Q5	UN1213	TRANSISTOR-RESISTOR	1	
Q6	UN1111	TRANSISTOR-RESISTOR	1	
Q7	UN1213	TRANSISTOR-RESISTOR	1	
Q9	UN1113	TRANSISTOR-RESISTOR	1	
Q11-21	UN1213	TRANSISTOR-RESISTOR	11	
Q22,23	2SD636	TRANSISTOR	2	
Q24	2SD1271A	TRANSISTOR	1	(P)
Q25,26	2SD636	TRANSISTOR	2	
Q27	DTC144EA	TRANSISTOR RESISTOR	1	OR UN1213
		RESISTORS		
R1	ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R2	ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R3	ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R4,R5	ERDS2TJ123	C.RESISTOR 1/4W 12K	2	
R6	ERDS2TJ824	C.RESISTOR 1/4W 820K	1	
R7	ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R8	ERDS2TJ824	C.RESISTOR 1/4W 820K	1	
R9	EROS2CKG1501	M.RESISTOR 1/4W 1.5K	1	
R10	EROS2CKG1502	M.RESISTOR 1/4W 15K	1	
R11	ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R12	ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R13	ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R14	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R15	EROS2CKG2702	M.RESISTOR 1/4W 27K	1	
R16	ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R17	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R18	ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R19		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R20		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R21		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R22		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R23,24		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R25		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R26		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R27,28		EROS2CKG3301	M.RESISTOR 1/4W 3.3K	2	
R29		EROS2CKG2201	M.RESISTOR 1/4W 2.2K	1	
R30,31		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	2	
R32-39		EROS2CKG2702	M.RESISTOR 1/4W 27K	8	
R40		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R41-46		ERDS2TJ473	C.RESISTOR 1/4W 47K	6	
R47		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R48,49		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R50		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R51		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R52,53		ERDS2TJ224	C.RESISTOR 1/4W 220K	2	
R54		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R55		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R56		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R57,58		ERDS2TJ224	C.RESISTOR 1/4W 220K	2	
R59		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R60		ERDS2TJ224	C.RESISTOR 1/4W 220K	1	
R61		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R62		ERDS2TJ184	C.RESISTOR 1/4W 180K	1	
R63		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R64-66		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R67		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R68		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R69		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R70		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R71		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R72		ERQ1AJP4R7S	F.RESISTOR 1W 4.7	1	
R73		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R74		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R75		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R76		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R77		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R78		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R79		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R80-83		ERD25TJ474	C.RESISTOR 1/4W 470K	4	
R84		EROS2CKG1502	M.RESISTOR 1/4W 15K	1	
R85		ERO25CKF8253	M.RESISTOR 1/4W 825K	1	
R86		ERO25CHF6813	M.RESISTOR 1/4W 681K	1	
R87		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R88		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R89		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R90		ERO25CKF8253	M.RESISTOR 1/4W 825K	1	
R91		ERO25CHF6813	M.RESISTOR 1/4W 681K	1	
R92		EROS2CKG1502	M.RESISTOR 1/4W 15K	1	
R93		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R94		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R95		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
RA1		EXBLD8103G	RESISTOR&RESISTOR 10K	1	
RA2		EXBR84561J	RESISTOR & RESISTOR 560	1	
RA6		EXBR88103J	RESISTOR & RESISTOR 10K	1	
RA7		EXBR88473J	RESISTOR-RESISTOR 47K	1	
S1		VJS1427	CONNECTOR(FEMALE)	1	
SW		VSS0207	SWITCH	1	
T1		VLT0237	TRANSFORMER	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
TP2,P3		VJR0400Y	TEST POINT	2	
TP6		VJR0400Y	TEST POINT	1	
TP9		VJR0400Y	TEST POINT	1	
TP10		VJR0400Y	TEST POINT	1	
TP15		VJR0400Y	TEST POINT	1	
TP17,18		VJR0400Y	TEST POINT	2	
TP22		VJR0400Y	TEST POINT	1	
TP24		VJR0400Y	TEST POINT	1	
TP27		VJR0400Y	TEST POINT	1	
TP32-34		VJR0400Y	TEST POINT	3	
TPG3		VJR0400B	TEST POINT	1	
VR1		VRV0063B504	V.RESISTOR 500K	1	
VR2		VRV0063B103	V.RESISTOR 10K	1	
VR3		VRV0063B202	V.RESISTOR 2K	1	
VR4		VRV0064B503	V.RESISTOR 50K	1	
VR7,R8		VRV0063B503	V.RESISTOR 50K	2	
VR10		VRV0064B503	V.RESISTOR 50K	1	
VR20		VRV0063B501	V.RESISTOR 500	1	
X1		VSX0257	CRYSTAL OSCILLATOR	1	
			MISCELLANEOUS		
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VSC2489	SHIELD CASE	1	
		VSC2490	SHIELD CASE	1	
		VXA2247	P.C.B. SHIELD PLATE	1	
		XSB3+6FR	SCREW	4	
		XYNV3+K6FR	SCREW	4	
	■	VEP82041B	P.C.BOARD W/COMPONENT AT SUB		PART OF VEP82034B
			CAPACITORS		
C39-41		ECUX1H103ZFN	CHIP 50V 0.01U	3	
C43-48		ECUX1H103ZFN	CHIP 50V 0.01U	6	
C57-65		ECUX1H103ZFN	CHIP 50V 0.01U	9	
C87		ECQV1H124JZ	P.CAPACITOR 50V 0.12U	1	
C88,89		ECUX1H103ZFN	CHIP 50V 0.01U	2	
C90-93		ECQM1H183JV	P.CAPACITOR 50V 0.018U	4	
C94-96		ECUX1H472KBN	CHIP 50V 4700P	3	
C97		ECQV1H124JZ	P.CAPACITOR 50V 0.12U	1	
C98,99		ECUX1H103ZFN	CHIP 50V 0.01U	2	
C100-03		ECQM1H183JV	P.CAPACITOR 50V 0.018U	4	
C104		ECQM1H182JV	P.CAPACITOR 50V 1800P	1	
C110		ECUX1H103ZFN	CHIP 50V 0.01U	1	
D14,15		MA153	DIODE	2	
D20,21		MA153	DIODE	2	
D53-56		MA1039	DIODE	4	
IC2		MC74HC4049F	IC	1	
IC4		MSM5210RS	IC	1	
IC5		VSI0202	IC	1	
IC6		MC74HC174F	IC	1	
IC7		MC74HC00F	IC	1	
IC8,C9		HD74HC193FP	IC	2	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC10		HD74HC193FP	IC	1	
IC28		MC74HC244F	IC	1	
IC29		MC74HC4075F	IC	1	
IC32		UPD4053BG	IC	1	
IC34		UPC4741G	IC	1	
IC35,36		UPC4558G	IC	2	
IC37		MC74HC32F	IC	1	
IC38		MC74HC08F	IC	1	
IC46,47		MC74HC157F	IC	2	
IC54-56		MC74HC161F	IC	3	
IC57		MC74HCU04F	IC	1	
IC58		MC74HC08F	IC	1	
IC59		MC74HC02F	IC	1	
IC60		MC74HC86F	IC	1	
IC61		MC74HC175F	IC	1	
IC62		MC74HC244F	IC	1	
IC63-65		HD74HC193FP	IC	3	
IC66,67		MN4049BS	IC	2	
IC68		UPC4082G	IC	1	
IC69		MC14051BF	IC	1	
IC70		UPC4558G	IC	1	
IC71		MC74HC244F	IC	1	
IC72-74		HD74HC193FP	IC	3	
IC75,76		MN4049BS	IC	2	
IC77		UPC4082G	IC	1	
IC78		MC14051BF	IC	1	
IC79		UPC4558G	IC	1	
P3		VJP2351	CONNECTOR	1	
P4		VJP2352	CONNECTOR	1	
			RESISTORS		
R96-98		ERJ6GEYG273	CHIP 1/16W 27K	3	
R99		ERJ6GEYG823	CHIP 1/16W 82K	1	
R100		ERJ6GEYG682	CHIP 1/16W 6.8K	1	
R101		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R102		ERJ6GEYJ394	CHIP 1/16W 390K	1	
R103,04		ERJ6GEYJ273	CHIP 1/16W 27K	2	
R105		ERJ6GEYJ394	CHIP 1/16W 390K	1	
R106		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R107		ERJ6GEYG182	CHIP 1/16W 1.8K	1	
R108		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R109		ERJ6GEYJ393	CHIP 1/16W 39K	1	
R110		ERJ6GEYG682	CHIP 1/16W 6.8K	1	
R111		ERSB27G222	THERMISTOR	1	
R112		ERJ6GEYG621	M.RESISTOR CH 1/16W 620	1	
R113		ERJ6GEYG272	CHIP 1/16W 2.7K	1	
R114-17		ERJ6GEYG133	CHIP 1/16W 13K	4	
R118-20		ERJ6GEYG273	CHIP 1/16W 27K	3	
R121		ERJ6GEYG823	CHIP 1/16W 82K	1	
R122		ERJ6GEYG682	CHIP 1/16W 6.8K	1	
R123		ERDS2TJ124	C.RESISTOR 1/4W 120K	1	
R124		ERJ6GEYJ394	CHIP 1/16W 390K	1	
R125,26		ERJ6GEYJ273	CHIP 1/16W 27K	2	
R127		ERJ6GEYJ394	CHIP 1/16W 390K	1	
R128		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R129		ERJ6GEYG182	CHIP 1/16W 1.8K	1	
R130		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R131		ERJ6GEYJ393	CHIP 1/16W 39K	1	
R132		ERJ6GEYG682	CHIP 1/16W 6.8K	1	
R133		ERSB27G222	THERMISTOR	1	
R134		ERJ6GEYG621	M.RESISTOR CH 1/16W 620	1	
R135		ERJ6GEYG272	CHIP 1/16W 2.7K	1	
R136-39		ERJ6GEYG133	CHIP 1/16W 13K	4	
R140,41		ERJ6GEYG564	M.RESISTOR CH 1/16W 560K	2	
R142		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R143,44		ERJ6GEYG333	CHIP 1/16W 33K	2	
R145		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R146,47		ERJ6GEYG273	CHIP 1/16W 27K	2	
R148		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R149,50		ERJ6GEYJ104	CHIP 1/16W 100K	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R151		ERJ6GEYJ393	CHIP 1/16W 39K	1	
R301,02		ERDS2TJ153	C.RESISTOR 1/4W 15K	2	
RA10,11		VCR0202	RESISTOR ARRAY	2	
TP4,P5		VJR0400Y	TEST POINT	2	
TP12,13		VJR0400Y	TEST POINT	2	
TP19		VJR0400Y	TEST POINT	1	
TP29-31		VJR0400Y	TEST POINT	3	
VR5,R6		VRV0064B203	V.RESISTOR 20K	2	
VR11,12		VRV0064B203	V.RESISTOR 20K	2	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

VEP81027B S10 POWER & DRIVE

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP81027B	P.C.BOARD W/COMPONENT		
S10			POWER & DRIVE		
			CAPACITORS		
C1		ECEA1EU101	E.CAPACITOR 25V 100U	1	
C3		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	1	
C4		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C5-C7		ECEA1EU101	E.CAPACITOR 25V 100U	3	
C12		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C15		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C23		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	1	
C38		ECEA1HN010SE	E.CAPACITOR 50V 1U	1	
C39		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C40		ECEA1HU4R7	E.CAPACITOR 50V 4.7U	1	
C41-43		ECEA1CU471	E.CAPACITOR 16V 470U	3	
C45-47		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	3	
C51		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C55,56		ECEA1HN010SE	E.CAPACITOR 50V 1U	2	
C58		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C59		ECEA1EU101	E.CAPACITOR 25V 100U	1	
C60		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C64		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C65		ECEA1EU101	E.CAPACITOR 25V 100U	1	
C66		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C70		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C76-78		ECCF1H101JC	C.CAPACITOR 50V 100P	3	
C80		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C81		ECCF1H101JC	C.CAPACITOR 50V 100P	1	
C82		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C83		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C84		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C90-92		ECEA1CU101	E.CAPACITOR 16V 100U	3	
C93		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C95		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C96		ECEA1EU471	E.CAPACITOR 25V 470U	1	
C97		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C98,99		ECEA1HU010	E.CAPACITOR 50V 1U	2	
C101		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C103		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C104		ECEA1HU3R3	E.CAPACITOR 50V 3.3U	1	
C108,09		ECEA1AU330	E.CAPACITOR 10V 33U	2	
C111		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C112		ECEA1AU101	E.CAPACITOR 10V 100U	1	
C114,15		ECEA1CU101	E.CAPACITOR 16V 100U	2	
C116-19		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
D1,D2		MA165	DIODE	2	
D8,D9		10E1	DIODE	2	
D10		10E1	DIODE	1	
D11		MA165	DIODE	1	
D13,14		RD4.7EB2	ZENER 4.7V	2	
D16		MA165	DIODE	1	
D20		RD4.7EB2	ZENER 4.7V	1	
D22		RD4.7EB2	ZENER 4.7V	1	
D23		MA165	DIODE	1	
D26		MA165	DIODE	1	
D28		RD4.7EB2	ZENER 4.7V	1	
D30		RD4.7EB2	ZENER 4.7V	1	
D33		MA165	DIODE	1	
D39		RD2.7EB2	ZENER 2.7V	1	
D41-45		MA165	DIODE	5	
D47,48		MA165	DIODE	2	
D51-54		MA165	DIODE	4	
D56-60		MA165	DIODE	5	
D67		RD6.8EB2	ZENER 6.8V	1	
D69		MA165	DIODE	1	
IC1		BA6238A	IC	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC2		SN75468N	IC	1	
IC3		BA6238A	IC	1	
IC4		STA301A	IC	1	
IC9		UPC358C	IC	1	
IC10-12		UPC358C	IC	3	
Q1,Q2		2SB641	TRANSISTOR	2	
Q7,Q8		2SA1096	TRANSISTOR	2	
Q9		2SB643	TRANSISTOR	1	
Q10		2SB643	TRANSISTOR	1	
Q11		2SC2497	TRANSISTOR	1	
Q12		2SD638	TRANSISTOR	1	
Q13,14		2SB641	TRANSISTOR	2	
Q17,18		2SB641	TRANSISTOR	2	
Q19		DTC114EA	TRANSISTOR RESISTOR	1	
Q20		2SB1057	TRANSISTOR	1	
Q21		2SD1488	TRANSISTOR	1	
Q22		2SB1057	TRANSISTOR	1	
Q25-28		2SD636	TRANSISTOR	4	
Q29		2SB641	TRANSISTOR	1	
Q30-32		DTC114EA	TRANSISTOR RESISTOR	3	
Q37		2SD1266	TRANSISTOR	1	
Q38		2SD638	TRANSISTOR	1	
Q41-43		2SB641	TRANSISTOR	3	
Q46,47		2SB641	TRANSISTOR	2	
Q50-52		DTC114EA	TRANSISTOR RESISTOR	3	
Q54,55		DTC114EA	TRANSISTOR RESISTOR	2	
			RESISTORS		
R7		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R8		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R9		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R15		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R16		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R17		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R18		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R24		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R25		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R26		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R31		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R32		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R33		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R34		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R42		ERX1ANJ1R0	M.RESISTOR 1W 1	1	
R45		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R46		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R47		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R53		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R54		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R55		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R56		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R60		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R65		ERF2AJR10	W.RESISTOR 2W 0.1	1	
R66		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R67		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R69		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R70		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R71		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R73		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R75		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R76		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R77		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R82		ERF2AJR10	W.RESISTOR 2W 0.1	1	
R83		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R84		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R86		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R87		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R88		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R90		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R92		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R93		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R94		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R99		ERF2AJR10	W.RESISTOR 2W 0.1	1	
R100		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R101		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R103		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R104		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R105		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R107		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R108		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R109		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R132		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R133		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R134		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R135		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R136		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R137		ERDS2TJ221	C.RESISTOR 1/4W 220	1	
R138		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R140		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R150		ERF2AJR10	W.RESISTOR 2W 0.1	1	
R152		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R153		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R154		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R155		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R156		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R157		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R158		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R159		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R162		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R164		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R166		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R167		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R168		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R169-71		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R172		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R173,74		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R176-78		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R179		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R180,81		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R182		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R184,85		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R186		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R187		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R188		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R189		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R190,91		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R199		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R202		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R204		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R207,08		ERDS2TJ333	C.RESISTOR 1/4W 33K	2	
R210,11		ERDS2TJ821	C.RESISTOR 1/4W 820	2	
R213,14		ERDS2TJ821	C.RESISTOR 1/4W 820	2	
R217		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R218		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R219		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R220		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R239		ERX1ANJ1R0	M.RESISTOR 1W 1	1	
R240		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R241		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
TP2-P6		VJR0138Y	TEST POINT	5	
TP7,P8		VJR0138B	TEST POINT	2	
TP9		VJR0138Y	TEST POINT	1	
TP10,11		VJR0138Y	TEST POINT	2	
TP13		VJR0138Y	TEST POINT	1	
VR72		VRV0063B102	V.RESISTOR 1K	1	
VR89		VRV0063B102	V.RESISTOR 1K	1	
VR106		VRV0063B102	V.RESISTOR 1K	1	
VR139		VRV0063B202	V.RESISTOR 2K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
			MISCELLANEOUS		
		VHN0011	NYLON NAT	2	
		VML2143	CARD PULLER	1	
		VML2144	CARD PULLER	1	
		VMZ1237	POWER BARRIER	1	
		VSC1819	SHIELD CASE	1	
		XYN3+C10S	SCREW	9	
	■	VEP85007B	P.C.BOARD W/COMPONENT		
			AT HEAD AMP		
			CAPACITORS		
C7,C8		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C9		ECSF0JE106	T.CAPACITOR 6.3V 10U	1	
C10		ECEA1ESS100	E.CAPACITOR 25V 10U	1	
C11-13		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C14		ECSF0JE106	T.CAPACITOR 6.3V 10U	1	
C15		ECEA1ESS100	E.CAPACITOR 25V 10U	1	
C16-18		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C19		ECSF0JE106	T.CAPACITOR 6.3V 10U	1	
C20		ECEA1ESS100	E.CAPACITOR 25V 10U	1	
C21-23		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C24		ECSF0JE106	T.CAPACITOR 6.3V 10U	1	
C25		ECEA1ESS100	E.CAPACITOR 25V 10U	1	
C26		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C28		ECEA1EU101	E.CAPACITOR 25V 100U	1	
L1,L2		VLQEL06F101J	COIL 100UH	2	
P421,22		VJP1144	CONNECTOR(MALE)	2	
P423		VJP1188	CONNECTOR(MALE)	1	
P424		VJP1145	CONNECTOR(MALE)	1	
Q1		2SC3811	TRANSISTOR	1	(R)
Q2		2SK316	TRANSISTOR	1	
Q3,Q4		2SC3811	TRANSISTOR	2	(R)
Q5		2SK316	TRANSISTOR	1	
Q6,Q7		2SC3811	TRANSISTOR	2	(R)
Q8		2SK316	TRANSISTOR	1	
Q9		2SC3811	TRANSISTOR	1	(R)
Q10		2SC3811	TRANSISTOR	1	(R)
Q11		2SK316	TRANSISTOR	1	
Q12		2SC3811	TRANSISTOR	1	(R)
			RESISTORS		
R25		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R26		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R27		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R28		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R29		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R30		EROS2CKF75R0	M.RESISTOR 1/4W 75	1	
R31		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R32		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R33		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R34		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R35		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R36		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R37		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R38		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R39		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R40		EROS2CKF75RO	M.RESISTOR 1/4W 75	1	
R41		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R42		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R43		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R44		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R45		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R46		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R47		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R48		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R49		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R50		EROS2CKF75RO	M.RESISTOR 1/4W 75	1	
R51		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R52		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R53		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R54		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R55		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R56		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R57		ERDS2TJ683	C.RESISTOR 1/4W 68K	1	
R58		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R59		ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R60		EROS2CKF75RO	M.RESISTOR 1/4W 75	1	
R61		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R62		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R63		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R64		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R65		ERD25FAJ180	C.RESISTOR 1/4W 18	1	
T3,T4		VLT0535	TRANSFORMER	2	
T5,T6		VLT0536	TRANSFORMER	2	
			MISCELLANEOUS		
		VMP0565	P.C.B.HOLDER ANGLE	1	
		VMP0566	P.C.B.HOLDER ANGLE	1	
		VSC2340	SHIELD CASE	1	
		VSC2341	SHIELD CASE	1	
		VSC2342	SHIELD CASE	1	
		XTV3+6F	SCREW	4	
	■	VEP80363B	P.C.BOARD W/COMPONENT		
			BACK PANEL		
			CAPACITORS		
C1		ECEA1CK101	E.CAPACITOR 16V 100U	1	
C2		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C3		ECEA1CK101	E.CAPACITOR 16V 100U	1	
C4		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C5		ECKF1H331KB	C.CAPACITOR 50V 330P	1	
C8,C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C10-14		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	5	
C16-23		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	8	
D1		MA165	DIODE	1	OR 1SS119, 1SS254
IC1,C2		MC14021BF	IC	2	
IC3		MC14050BF	IC	1	
L1,L2		VLQEL06F221K	COIL 220UH	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
P102		VJP1233T	CONNECTOR(MALE) 6P	1	
P104		VJP1235T	CONNECTOR(MALE) 8P	1	
P114		VJP1237T	CONNECTOR(MALE) 10P	1	
P134		VJP1235T	CONNECTOR(MALE) 8P	1	
P135		VJP1233T	CONNECTOR(MALE) 6P	1	
			RESISTORS		
R13		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R14		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R15		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R16,17		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R18		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R19		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R20		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
RA1		EXBF9E103J	COMBI R-R 10K	1	
RA2,A3		EXBF8V103J	COMBI R-R 10K	2	
RA4		EXBF9E103J	COMBI R-R 10K	1	
RA5,A6		EXBF8V103J	COMBI R-R 10K	2	
RA7,A8		EXBF5E103J	COMBI R-R 10K	2	
RA11		EXBF5E332J	COMBI R-R 3.3K	1	
SW1		VSS0243	SWITCH	1	
SW2-W5		VSS0119	SWITCH	4	
SW7		VSS0243	SWITCH	1	
SW8		VSS0119	SWITCH	1	
SW13		VSS0119	SWITCH	1	
SW16,17		VSS0119	SWITCH	2	
SW22		VSS0119	SWITCH	1	
VR1		VRV0109B502	V.RESISTOR 5K	1	
VR2		EVUF2AE20B53	V.RESISTOR 5K	1	
VR3		EVUF3AE20B53	V.RESISTOR 5K	1	
VR8		EVUF2AS01B53	V.RESISTOR W	1	
VR10		EVUF2AS01B53	V.RESISTOR W	1	
	■	VEP80151A	P.C.BOARD W/COMPONENT		
			FRONT PANEL CONNECTION		
P111		VJP1145	CONNECTOR(MALE)	1	
P114		VJP1976	CONNECTOR(MALE)	1	
P126		VJP1144	CONNECTOR(MALE)	1	
	■	VEP80355C	P.C.BOARD W/COMPONENT		
			PEAK METER		
			CAPACITORS		
C1-C4		ECEA1CK101	E.CAPACITOR 16V 100U	4	
C5		ECEA0JK101	E.CAPACITOR 6.3V 100U	1	
C6		ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C7		ECUX1H220JCN	CHIP 50V 22P	1	
C8		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C9		ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C10		ECUX1H101JCN	CHIP 50V 100P	1	

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Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C11	ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C12	ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C13	ECUX1H220JCN	CHIP 50V 22P	1	
C14	ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C15	ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C16	ECUX1H101JCN	CHIP 50V 100P	1	
C17	ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C18	ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C19	ECUX1H220JCN	CHIP 50V 22P	1	
C20	ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C21	ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C22	ECUX1H101JCN	CHIP 50V 100P	1	
C23	ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C24	ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C25	ECUX1H220JCN	CHIP 50V 22P	1	
C26	ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C27	ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C28	ECUX1H101JCN	CHIP 50V 100P	1	
C29	ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C30-37	ECUX1H103ZFN	CHIP 50V 0.01U	8	
D1-D9	MA151WA	DIODE	9	
D10-12	MA151WA	DIODE	3	
IC1-C3	UPC4741C	IC	3	
P1	VJP1149	CONNECTOR(MALE)	1	
P2	VJP1143	CONNECTOR(MALE)	1	
P3	VJP1188	CONNECTOR(MALE)	1	
P4,P5	VJP1152	CONNECTOR(MALE)	2	
Q1	2SD602	TRANSISTOR	1	
Q2	2SB710	TRANSISTOR CHIP	1	(R)
Q3-Q6	2SB709	TRANSISTOR CHIP	4	(R)
Q7	2SD1328	TRANSISTOR	1	
Q8,Q9	2SB709	TRANSISTOR CHIP	2	(R)
Q10,11	2SB709	TRANSISTOR CHIP	2	(R)
Q12	2SD1328	TRANSISTOR	1	
Q13-16	2SB709	TRANSISTOR CHIP	4	(R)
Q17	2SD1328	TRANSISTOR	1	
Q18-21	2SB709	TRANSISTOR CHIP	4	(R)
Q22	2SD1328	TRANSISTOR	1	
		RESISTORS		
R1,R2	ERJ6GEYJ331	CHIP 1/16W 330	2	
R3	ERJ6GEYJ823	CHIP 1/16W 82K	1	
R4	ERJ6GEYJ122	CHIP 1/16W 1.2K	1	
R5	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6	ERJ6GEYJ564	CHIP 1/16W 560K	1	
R7	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R8	ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R9	ERJ6GEYJ223	CHIP 1/16W 22K	1	
R10	ERJ6GEYJ223	CHIP 1/16W 22K	1	
R11	ERJ6GEYJ471	CHIP 1/16W 470	1	
R12	ERJ6GEYJ224	CHIP 1/16W 220K	1	
R13	ERJ6GEYJ154	CHIP 1/16W 150K	1	
R14	ERJ6GEYJ824	CHIP 1/16W 820K	1	
R15	ERJ6GEYJ124	CHIP 1/16W 120K	1	
R16	ERJ6GEYJ184	CHIP 1/16W 180K	1	
R17	ERJ6GEYJ105	CHIP 1/16W 1M	1	
R18	ERJ6GEYJ684	CHIP 1/16W 680K	1	
R19	ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R20	ERJ6GEYJ102	CHIP 1/16W 1K	1	
R21	ERJ6GEYJ821	CHIP 1/16W 820	1	
R22	ERJ6GEYJ471	CHIP 1/16W 470	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R23	ERJ6GEYJ821	CHIP 1/16W 820	1	
R24	ERJ6GEYJ103	CHIP 1/16W 10K	1	
R25	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R26	ERJ6GEYJ564	CHIP 1/16W 560K	1	
R27	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R28	ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R29,30	ERJ6GEYJ223	CHIP 1/16W 22K	2	
R31	ERJ6GEYJ471	CHIP 1/16W 470	1	
R32	ERJ6GEYJ224	CHIP 1/16W 220K	1	
R33	ERJ6GEYJ154	CHIP 1/16W 150K	1	
R34	ERJ6GEYJ824	CHIP 1/16W 820K	1	
R35	ERJ6GEYJ124	CHIP 1/16W 120K	1	
R36	ERJ6GEYJ184	CHIP 1/16W 180K	1	
R37	ERJ6GEYJ105	CHIP 1/16W 1M	1	
R38	ERJ6GEYJ684	CHIP 1/16W 680K	1	
R39	ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R40	ERJ6GEYJ102	CHIP 1/16W 1K	1	
R41	ERJ6GEYJ821	CHIP 1/16W 820	1	
R42	ERJ6GEYJ471	CHIP 1/16W 470	1	
R43	ERJ6GEYJ821	CHIP 1/16W 820	1	
R44	ERJ6GEYJ103	CHIP 1/16W 10K	1	
R45	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R46	ERJ6GEYJ564	CHIP 1/16W 560K	1	
R47	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R48	ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R49,50	ERJ6GEYJ223	CHIP 1/16W 22K	2	
R51	ERJ6GEYJ471	CHIP 1/16W 470	1	
R52	ERJ6GEYJ224	CHIP 1/16W 220K	1	
R53	ERJ6GEYJ154	CHIP 1/16W 150K	1	
R54	ERJ6GEYJ824	CHIP 1/16W 820K	1	
R55	ERJ6GEYJ124	CHIP 1/16W 120K	1	
R56	ERJ6GEYJ184	CHIP 1/16W 180K	1	
R57	ERJ6GEYJ105	CHIP 1/16W 1M	1	
R58	ERJ6GEYJ684	CHIP 1/16W 680K	1	
R59	ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R60	ERJ6GEYJ102	CHIP 1/16W 1K	1	
R61	ERJ6GEYJ821	CHIP 1/16W 820	1	
R62	ERJ6GEYJ471	CHIP 1/16W 470	1	
R63	ERJ6GEYJ821	CHIP 1/16W 820	1	
R64	ERJ6GEYJ103	CHIP 1/16W 10K	1	
R65	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R66	ERJ6GEYJ564	CHIP 1/16W 560K	1	
R67	ERJ6GEYJ473	CHIP 1/16W 47K	1	
R68	ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R69,70	ERJ6GEYJ223	CHIP 1/16W 22K	2	
R71	ERJ6GEYJ471	CHIP 1/16W 470	1	
R72	ERJ6GEYJ224	CHIP 1/16W 220K	1	
R73	ERJ6GEYJ154	CHIP 1/16W 150K	1	
R74	ERJ6GEYJ824	CHIP 1/16W 820K	1	
R75	ERJ6GEYJ124	CHIP 1/16W 120K	1	
R76	ERJ6GEYJ184	CHIP 1/16W 180K	1	
R77	ERJ6GEYJ105	CHIP 1/16W 1M	1	
R78	ERJ6GEYJ684	CHIP 1/16W 680K	1	
R79	ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R80	ERJ6GEYJ102	CHIP 1/16W 1K	1	
R81	ERJ6GEYJ821	CHIP 1/16W 820	1	
R82	ERJ6GEYJ471	CHIP 1/16W 470	1	
R83	ERJ6GEYJ821	CHIP 1/16W 820	1	
R84	ERJ6GEYJ103	CHIP 1/16W 10K	1	
R90-93	ERJ6GEYJ124	CHIP 1/16W 120K	4	
TP1-P4	VJR0400Y	TEST POINT	4	
TPG	VJR0400B	TEST POINT	1	
VR1	VRV0110B503	V.RESISTOR 50K	1	
VR2	VRV0110B103	V.RESISTOR 10K	1	
VR3	VRV0110B503	V.RESISTOR 50K	1	ON VEP80355A
VR3	VRV0110B103	V.RESISTOR 10K	1	ON VEP80355C
VR4	VRV0110B503	V.RESISTOR 50K	2	
VR5	VRV0110B103	V.RESISTOR 10K	1	
VR6	VRV0110B503	V.RESISTOR 50K	1	ON VEP80355A

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR6		VRVO110B103	V.RESISTOR 10K	1	ON VEP80355C
VR7		VRVO110B503	V.RESISTOR 50K	2	
VR8		VRVO110B103	V.RESISTOR 10K	1	
VR9		VRVO110B503	V.RESISTOR 50K	1	ON VEP80355A
VR9		VRVO110B103	V.RESISTOR 10K	1	ON VEP80355C
VR10		VRVO110B503	V.RESISTOR 50K	1	
VR11		VRVO110B103	V.RESISTOR 10K	1	
VR12		VRVO110B502	V.RESISTOR 5K	1	ON VEP80355A
VR12		VRVO110B103	V.RESISTOR 10K	1	ON VEP80355C
	■	VEP80355B	P.C.BOARD W/COMPONENT		
			PEAK METER		
			CAPACITORS		
C1-C4		ECEA1CK101	E.CAPACITOR 16V 100U	4	
C6		ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C7		ECUX1H220JCN	CHIP 50V 22P	1	
C8		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C9		ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C10		ECUX1H101JCN	CHIP 50V 100P	1	
C11		ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C12		ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C13		ECUX1H220JCN	CHIP 50V 22P	1	
C14		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C15		ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C16		ECUX1H101JCN	CHIP 50V 100P	1	
C17		ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C18		ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C19		ECUX1H220JCN	CHIP 50V 22P	1	
C20		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C21		ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C22		ECUX1H101JCN	CHIP 50V 100P	1	
C23		ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C24		ECEA1HN010S	E.CAPACITOR 50V 1U	1	
C25		ECUX1H220JCN	CHIP 50V 22P	1	
C26		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C27		ECST1VD685Z	T.CAPACITOR 35V 6.8U	1	
C28		ECUX1H101JCN	CHIP 50V 100P	1	
C29		ECST1VY334Z	T.CAPACITOR 35V 0.33U	1	
C30-37		ECUX1H103ZFN	CHIP 50V 0.01U	8	
D1-D9		MA151WA	DIODE	9	
D10-12		MA151WA	DIODE	3	
IC1-C3		UPC4741C	IC	3	
P1		VJP1149	CONNECTOR(MALE)	1	
P2		VJP1143	CONNECTOR(MALE)	1	
P3		VJP1188	CONNECTOR(MALE)	1	
P4,P5		VJP1152	CONNECTOR(MALE)	2	
Q1		2SD602	TRANSISTOR	1	
Q2		2SB710	TRANSISTOR CHIP	1	(R)
Q3-Q6		2SB709	TRANSISTOR CHIP	4	(R)
Q7		2SD1328	TRANSISTOR	1	
Q8,Q9		2SB709	TRANSISTOR CHIP	2	(R)
Q10,11		2SB709	TRANSISTOR CHIP	2	(R)
Q12		2SD1328	TRANSISTOR	1	
Q13-16		2SB709	TRANSISTOR CHIP	4	(R)
Q17		2SD1328	TRANSISTOR	1	
Q18-21		2SB709	TRANSISTOR CHIP	4	(R)

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
Q22		2SD1328	TRANSISTOR	1	
			RESISTORS		
R1,R2		ERJ6GEYJ331	CHIP 1/16W 330	2	
R4		ERJ6GEY0R00	CHIP 1/16W 0	1	
R5		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R7		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R8		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R9		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R10		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R11		ERJ6GEYJ221	CHIP 1/16W 220	1	
R12		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R13		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R14		ERJ6GEYJ824	CHIP 1/16W 820K	1	
R15		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R16		ERJ6GEYJ184	CHIP 1/16W 180K	1	
R17		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R18		ERJ6GEYJ684	CHIP 1/16W 680K	1	
R19		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R20		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R21		ERJ6GEYJ821	CHIP 1/16W 820	1	
R22		ERJ6GEYJ471	CHIP 1/16W 470	1	
R23		ERJ6GEYJ821	CHIP 1/16W 820	1	
R24		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R25		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R26		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R27		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R28		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R29,30		ERJ6GEYJ223	CHIP 1/16W 22K	2	
R31		ERJ6GEYJ221	CHIP 1/16W 220	1	
R32		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R33		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R34		ERJ6GEYJ824	CHIP 1/16W 820K	1	
R35		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R36		ERJ6GEYJ184	CHIP 1/16W 180K	1	
R37		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R38		ERJ6GEYJ684	CHIP 1/16W 680K	1	
R39		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R40		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R41		ERJ6GEYJ821	CHIP 1/16W 820	1	
R42		ERJ6GEYJ471	CHIP 1/16W 470	1	
R43		ERJ6GEYJ821	CHIP 1/16W 820	1	
R44		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R45		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R46		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R47		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R48		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R49,50		ERJ6GEYJ223	CHIP 1/16W 22K	2	
R51		ERJ6GEYJ221	CHIP 1/16W 220	1	
R52		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R53		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R54		ERJ6GEYJ824	CHIP 1/16W 820K	1	
R55		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R56		ERJ6GEYJ184	CHIP 1/16W 180K	1	
R57		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R58		ERJ6GEYJ684	CHIP 1/16W 680K	1	
R59		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R60		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R61		ERJ6GEYJ821	CHIP 1/16W 820	1	
R62		ERJ6GEYJ471	CHIP 1/16W 470	1	
R63		ERJ6GEYJ821	CHIP 1/16W 820	1	
R64		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R65		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R66		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R67		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R68		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R69,70		ERJ6GEYJ223	CHIP 1/16W 22K	2	
R71		ERJ6GEYJ221	CHIP 1/16W 220	1	
R72		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R73		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R74		ERJ6GEYJ824	CHIP 1/16W 820K	1	
R75		ERJ6GEYJ124	CHIP 1/16W 120K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R76		ERJ6GEYJ184	CHIP 1/16W 180K	1	
R77		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R78		ERJ6GEYJ684	CHIP 1/16W 680K	1	
R79		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R80		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R81		ERJ6GEYJ821	CHIP 1/16W 820	1	
R82		ERJ6GEYJ471	CHIP 1/16W 470	1	
R83		ERJ6GEYJ821	CHIP 1/16W 820	1	
R84		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R90-93		ERJ6GEYJ124	CHIP 1/16W 120K	4	
TP1-P4		VJR0400Y	TEST POINT	4	
TPG		VJR0400B	TEST POINT	1	
VR1		VRV0110B503	V.RESISTOR 50K	1	
VR2		VRV0110B103	V.RESISTOR 10K	1	
VR3,R4		VRV0110B503	V.RESISTOR 50K	2	
VR5		VRV0110B103	V.RESISTOR 10K	1	
VR6,R7		VRV0110B503	V.RESISTOR 50K	2	
VR8		VRV0110B103	V.RESISTOR 10K	1	
VR9		VRV0110B503	V.RESISTOR 50K	1	
VR10		VRV0110B503	V.RESISTOR 50K	1	
VR11		VRV0110B103	V.RESISTOR 10K	1	
VR12		VRV0110B502	V.RESISTOR 5K	1	
	■	VEP82035A	P.C.BOARD W/COMPONENT		
			REEL DRIVE		
			CAPACITORS		
C1-C3		ECEA1HN4R7S	E.CAPACITOR 50V 4.7U	3	
C4		ECEA1HU470	E.CAPACITOR 50V 47U	1	
C5		ECEA50ZR33	E.CAPACITOR 50V 0.33U	1	
C6		ECEA1EU101	E.CAPACITOR 25V 100U	1	
C7,C8		ECQM1H103JV	P.CAPACITOR 50V 0.01U	2	
C9		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C10,11		ECEA50ZR33	E.CAPACITOR 50V 0.33U	2	
C12		ECEA1HU010	E.CAPACITOR 50V 1U	1	
C13		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C14		ECEA1HU2R2	E.CAPACITOR 50V 2.2U	1	
C15		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C16		ECEA1HSSR33	E.CAPACITOR 50V 0.33U	1	
C17		ECEA1HU470	E.CAPACITOR 50V 47U	1	
C18-20		ECEA1HN4R7S	E.CAPACITOR 50V 4.7U	3	
C21		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C22-24		ECEA50ZR22	E.CAPACITOR 50V 0.22U	3	
C25		ECQM1H822JV	P.CAPACITOR 50V 8200P	1	
C26,27		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C28		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C29,30		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C31		ECEA1EU470	E.CAPACITOR 25V 47U	1	
C32		ECEA1HU470	E.CAPACITOR 50V 47U	1	
C33,34		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C35		ECEA1HU470	E.CAPACITOR 50V 47U	1	
C36		ECEA1EU101	E.CAPACITOR 25V 100U	1	
C37,38		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C39		ECQM1H562JV	P.CAPACITOR 50V 5600P	1	
C40		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C41		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C42		ECQM1H562JV	P.CAPACITOR 50V 5600P	1	
C43		ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C44		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C45		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C46,47		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C48		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C615,16		ECKF1H102KB	C.CAPACITOR 50V 1000P	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C617		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C618,19		ECKF1H102KB	C.CAPACITOR 50V 1000P	2	
D1-D3		10E1	DIODE	3	
D4-D8		MA165	DIODE	5	
D9		10E1	DIODE	1	
D10		10E1	DIODE	1	
IC1		AN640G	IC	1	
IC2		UPC358C	IC	1	
IC3		AN640G	IC	1	
IC4		UPD4081BC	IC	1	
IC5		UPC358C	IC	1	
IC267		MN4050B	IC	1	
IC268		MC14013BCP	IC	1	
L3		VLQEL06F221K	COIL 220UH	1	
L14,15		VLP0017	COIL	2	
P409		VJP1237T	CONNECTOR(MALE) 10P	1	
Q32		2SD1275	TRANSISTOR	1	
Q33		2SD636	TRANSISTOR	1	
Q34		2SD1275	TRANSISTOR	1	
Q35		2SB941	TRANSISTOR	1	
Q164-67		2SD636	TRANSISTOR	4	
			RESISTORS		
R1-R3		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R4-R6		ERD50TJ150	C.RESISTOR 1/2W 15	3	
R7		ERX1ANJR82U	M.RESISTOR 1W 0.82	1	
R8,R9		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R10		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R11-13		ERG1ANJ151U	M.RESISTOR 1W 150	3	
R14-16		ERDS2TJ102	C.RESISTOR 1/4W 1K	3	
R17-19		ERDS2TJ151	C.RESISTOR 1/4W 150	3	
R20		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R21		ERDS2TJ183	C.RESISTOR 1/4W 18K	1	
R22		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R23		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R24,25		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R26		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R27,28		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R29		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R30		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R31		ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R32		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R33		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R34		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R35		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R36		ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R37		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R38		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R39-41		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R42		ERX1ANJR68	M.RESISTOR 1W 0.68	1	
R43		ERD50TJ121	C.RESISTOR 1/2W 120	1	
R44		ERD50TJ270	C.RESISTOR 1/2W 27	1	
R45		ERD50TJ121	C.RESISTOR 1/2W 120	1	
R46		ERD50TJ270	C.RESISTOR 1/2W 27	1	
R47		ERD50TJ121	C.RESISTOR 1/2W 120	1	
R48		ERD50TJ270	C.RESISTOR 1/2W 27	1	
R49		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R50		ERDS2TJ123	C.RESISTOR 1/4W 12K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R51		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R52		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R53		ERDS2TJ563	C.RESISTOR 1/4W 56K	1	
R54		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R55		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R57		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R58		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R59		ERQ1CJP2R2S	FUSE 1W 2.2	1	
R60		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R61		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R66-68		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R69		ERG1ANJ101	M.RESISTOR 1W 100	1	
R70		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R71		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R72		ERG1ANJ330	M.RESISTOR 1W 33	1	
R73		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R74		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R75		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R76		ERG1ANJ560	M.RESISTOR 1W 56	1	
R77		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R78		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R79		ERG1ANJ330	M.RESISTOR 1W 33	1	
R80		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R81,82		ERDS2TJ104	C.RESISTOR 1/4W 100K	2	
R83		ERX1ANJ1R0	M.RESISTOR 1W 1	1	
R84		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R85,86		ERDS2TJ104	C.RESISTOR 1/4W 100K	2	
R87		ERX1ANJ1R0	M.RESISTOR 1W 1	1	
R876		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R877		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R878		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R879		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R880		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R881		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R882		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R883		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R884		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R885		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R886		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R887		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R888		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R889		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R900		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R901		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R902-05		ERDS2TJ101	C.RESISTOR 1/4W 100	4	
			MISCELLANEOUS		
		VMP1583	HOLDER ANGLE	1	
		VSC1860	SHIELD CASE	2	
		XSN3+8S	SCREW	5	
		XYN3+F8RS	SCREW	6	
	■	VEP80368A	P.C.BOARD W/COMPONENT		FOR AU-630
			HOUR METER		
P105		VJP1149	CONNECTOR(MALE)	1	
			MISCELLANEOUS		
		VSE0041	HOUR METER	1	
	■	VEP00E13D	P.C.BOARD W/COMPONENT		

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
			REMOTE1		
P328		VJP2343	CONNECTOR (MALE)	1	
			MISCELLANEOUS		
		VJS1580	SOCKET	1	
		VMA6578	CONNECTOR ANGLE	2	
		XYN3+C10S	SCREW	2	
	■	VEP80419A	P.C.BOARD W/COMPONENT		
			REMOTE MAIN		
P329		VJP2349	CONNECTOR (MALE)	1	
P361		VJP1152	CONNECTOR(MALE)	1	
			MISCELLANEOUS		
		VJS2642A009	CONNECTOR (FEMALE)	2	
		VJS2642A015	CONNECTOR (FEMALE)	1	
		VJS2642A025	CONNECTOR (FEMALE)	1	
		VMP1749	HOLDER CASE	1	
		VXQ0102	SCREW	8	
	■	VEP80297A	P.C.BOARD W/COMPONENT		
			VIDEO OUT		
P308		VJP1107	CONNECTOR(MALE)	1	
	■	VEP83067A	P.C.BOARD W/COMPONENT		
			SMPTE OUT		
PO		VJP1281T	CONNECTOR (MALE)	1	
	■	VEP84052F	P.C.BOARD W/COMPONENT		
			AUDIO MAIN		
			CAPACITORS		
C103		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C104,05		ECEA1CU100	E.CAPACITOR 16V 10U	2	
C106		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C107		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C108		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C109		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C110		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C111		ECQP1H122J2	P.CAPACITOR 50V 1200P	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C112,13		ECCF1H220JC	C.CAPACITOR 50V 22P	2	
C114,15		ECEA1CN470S	E.CAPACITOR 16V 47U	2	
C116		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C117		ECQB1H103JZ	P.CAPACITOR 50V 0.01U	1	
C118,19		ECEA1CU221	E.CAPACITOR 16V 220U	2	
C120		ECEA1CU220	E.CAPACITOR 16V 22U	1	
C203		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C204,05		ECEA1CU100	E.CAPACITOR 16V 10U	2	
C206		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C207		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C208		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C209		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C210		ECEA1CN100S	E.CAPACITOR 16V 10U	1	
C211		ECQP1H122JZ	P.CAPACITOR 50V 1200P	1	
C212,13		ECCF1H220JC	C.CAPACITOR 50V 22P	2	
C214,15		ECEA1CN470S	E.CAPACITOR 16V 47U	2	
C303		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C304,05		ECEA1CU100	E.CAPACITOR 16V 10U	2	
C306		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C307,08		ECEA1CU221	E.CAPACITOR 16V 220U	2	
C309		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C310		ECQP1H122JZ	P.CAPACITOR 50V 1200P	1	
C312,13		ECCF1H220JC	C.CAPACITOR 50V 22P	2	
C314,15		ECEA1CN470S	E.CAPACITOR 16V 47U	2	
C403		ECCF1H470JC	C.CAPACITOR 50V 47P	1	
C404,05		ECEA1CU100	E.CAPACITOR 16V 10U	2	
C406		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C407		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C408		ECEA1CU471	E.CAPACITOR 16V 470U	1	
C409		ECEA1CU221	E.CAPACITOR 16V 220U	1	
C410		ECQP1H122JZ	P.CAPACITOR 50V 1200P	1	
D101-04		MA165	DIODE	4	
D201,02		MA165	DIODE	2	
D301,02		MA165	DIODE	2	
D401,02		MA165	DIODE	2	
IC102		UPC4558C	IC	1	
IC103,04		NE5534D	IC	2	
IC202		UPC4558C	IC	1	
IC203,04		NE5534D	IC	2	
IC302		UPC4558C	IC	1	
IC303,04		NE5534D	IC	2	
IC402		UPC4558C	IC	1	
P306		VJP1145	CONNECTOR(MALE)	1	
P310		VJP1145	CONNECTOR(MALE)	1	
P315-17		VJP1142	CONNECTOR(MALE)	3	
P320		VJP1188	CONNECTOR(MALE)	1	
P331-33		VJP1142	CONNECTOR(MALE)	3	
P352		VJP1144	CONNECTOR(MALE)	1	
P353-56		VJP1142	CONNECTOR(MALE)	4	
P357		VJP1188	CONNECTOR(MALE)	1	
P359		VJP1188	CONNECTOR(MALE)	1	
Q101		2SC1847	TRANSISTOR	1	(R)
Q102		2SA886V	TRANSISTOR	1	(R)
Q103		2SD638	TRANSISTOR	1	
Q104		2SB643	TRANSISTOR	1	
Q105,06		2SD636	TRANSISTOR	2	
Q107,08		2SD1330	TRANSISTOR	2	
Q109		DTC144EA	TRANSISTOR RESISTOR	1	OR UN1213
Q110,11		2SB641	TRANSISTOR	2	
Q201		2SC1847	TRANSISTOR	1	(R)
Q202		2SA886V	TRANSISTOR	1	(R)
Q203		2SD638	TRANSISTOR	1	
Q204		2SB643	TRANSISTOR	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
Q205,06		2SD636	TRANSISTOR	2	
Q207,08		2SD1330	TRANSISTOR	2	
Q301		2SC1847	TRANSISTOR	1	(R)
Q302		2SA886V	TRANSISTOR	1	(R)
Q303		2SD638	TRANSISTOR	1	
Q304		2SB643	TRANSISTOR	1	
Q305,06		2SD636	TRANSISTOR	2	
Q307,08		2SD1330	TRANSISTOR	2	
Q401		2SC1847	TRANSISTOR	1	(R)
Q402		2SA886V	TRANSISTOR	1	(R)
Q403		2SD638	TRANSISTOR	1	
Q404		2SB643	TRANSISTOR	1	
Q405,06		2SD636	TRANSISTOR	2	
			RESISTORS		
R119		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R120		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R121		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R122		EROS2CKG5602	M.RESISTOR 1/4W 56K	1	
R123		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R124		EROS2CKG2201	M.RESISTOR 1/4W 2.2K	1	
R125		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R126		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R127		ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R128,29		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R130,31		ERG12SJ100	M.RESISTOR 1/2W 10	2	
R132,33		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R134,35		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R137,38		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R142,43		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R144		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R150		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R151		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R152-55		EROS2CKF3301	M.RESISTOR 1/4W 3.3K	4	
R156,57		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	2	
R158		EROS2CKF9101	M.RESISTOR 1/4W 9.1K	1	
R159		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R160		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	1	
R161		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R162-65		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R166		EROS2CKF1501	M.RESISTOR 1/4W 1.5K	1	
R219		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R220		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R221		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R222		EROS2CKG5602	M.RESISTOR 1/4W 56K	1	
R223		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R224		EROS2CKG2201	M.RESISTOR 1/4W 2.2K	1	
R225		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R226		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R227		ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R228,29		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R230,31		ERG12SJ100	M.RESISTOR 1/2W 10	2	
R232,33		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R234,35		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R237		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R243		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R244		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R252-55		EROS2CKF3301	M.RESISTOR 1/4W 3.3K	4	
R256,57		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	2	
R258		EROS2CKF9101	M.RESISTOR 1/4W 9.1K	1	
R259		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R260		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	1	
R261		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R262-65		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R266		EROS2CKF1501	M.RESISTOR 1/4W 1.5K	1	
R319		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R320		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R321		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R322		EROS2CKG5602	M.RESISTOR 1/4W 56K	1	
R323		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R324		EROS2CKG2201	M.RESISTOR 1/4W 2.2K	1	
R325		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R326		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R327		ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R328,29		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R330,31		ERG12SJ100	M.RESISTOR 1/2W 10	2	
R332,33		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R334,35		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R336		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R337		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R352		EROS2CKF6801	M.RESISTOR 1/4W 6.8K	1	
R353		EROS2CKF3301	M.RESISTOR 1/4W 3.3K	1	
R354		EROS2CKF6801	M.RESISTOR 1/4W 6.8K	1	
R355		EROS2CKF3301	M.RESISTOR 1/4W 3.3K	1	
R356,57		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	2	
R358		EROS2CKF9101	M.RESISTOR 1/4W 9.1K	1	
R359		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R360		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	1	
R361		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R362-65		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R366		EROS2CKF1501	M.RESISTOR 1/4W 1.5K	1	
R367,68		EROS2CKF6801	M.RESISTOR 1/4W 6.8K	2	
R419		ERDS2TJ331	C.RESISTOR 1/4W 330	1	
R420		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R421		ERDS2TJ821	C.RESISTOR 1/4W 820	1	
R422		EROS2CKG5602	M.RESISTOR 1/4W 56K	1	
R423		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R424		EROS2CKG2201	M.RESISTOR 1/4W 2.2K	1	
R425		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R426		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R427		ERDS2TJ100	C.RESISTOR 1/4W 10	1	
R428,29		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R430,31		ERG12SJ100	M.RESISTOR 1/2W 10	2	
R432,33		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R434,35		ERDS2TJ473	C.RESISTOR 1/4W 47K	2	
R436		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R437		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
SW101		VSS0180	SWITCH	1	
SW102		VSS0182	SWITCH	1	
SW201		VSS0180	SWITCH	1	
SW202		VSS0182	SWITCH	1	
SW301		VSS0180	SWITCH	1	
SW302		VSS0182	SWITCH	1	
SW401		VSS0180	SWITCH	1	
SW402		VSS0182	SWITCH	1	
T102		VTD0038	TRANSFORMER	1	
T202		VTD0038	TRANSFORMER	1	
T302		VTD0038	TRANSFORMER	1	
T402		VTD0038	TRANSFORMER	1	
			MISCELLANEOUS		
		VMZ0830	BARRIER	1	
	■	VEP80507A	P.C.BOARD W/COMPONENT		
			FILTER		
F1		XBA2C63TB0	FUSE	1	
P201,02		VJP1571	CONNECTOR(MALE)	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
			RESISTORS		
R2		ERF10HLKR39B	W.RESISTOR 10W 0.39	1	
			MISCELLANEOUS		
		VJF0716	FUSE HOLDER	2	
	■	VEP81036A	P.C.BOARD W/COMPONENT		
			SWITCHING POWER 1		
ARR1		VSF0069	FUSE	1	
			CAPACITORS		
C2		ECQU2A224MN	P.CAPACITOR 250V 0.22U	1	
C3,C4		VCK0083	C.CAPACITOR	2	
C5-C8		ECOS2DG471R	E.CAPACITOR 200V 470U	4	
C9		ECQF4334KZ	P.CAPACITOR 400V 0.33U	1	
C10,11		ECQF6102KZ	P.CAPACITOR 630V 1000P	2	
C12		ECEA1HG4R7S	E.CAPACITOR 50V 4.7U	1	
C13,14		ECQF6222KZ	P.CAPACITOR 630V 2200P	2	
C15		ECEA1HG4R7S	E.CAPACITOR 50V 4.7U	1	
C16		ECQU2A224MN	P.CAPACITOR 250V 0.22U	1	
C21		ECQF6222KZ	P.CAPACITOR 630V 2200P	1	
C22-24		ECEA1HG471S	E.CAPACITOR 50V 470U	3	
C25,26		VCK0083	C.CAPACITOR	2	
C27,28		ECQU2A224MN	P.CAPACITOR 250V 0.22U	2	
D1		D5SB60S	DIODE	1	
D2,D3		ERC25-04	DIODE	2	
D4,D5		ERB35-02	DIODE	2	
D6,D7		ERC25-04	DIODE	2	
D8,D9		ERB35-02	DIODE	2	
D23		ESAC25-02C	DIODE	1	
D24		RD10EB2	ZENER 10V	1	
L2		VLF0745	FILTER	1	
L3		VLT0310	TRANSFORMER	1	
L4		VLQ0241	COIL	1	
P210		VJP1557	CONNECTOR(MALE)	1	
P211		VJP1559	CONNECTOR(MALE)	1	
Q1,Q2		2SC3320	TRANSISTOR	2	
Q6		2SD751	TRANSISTOR	1	
Q7		2SC2497	TRANSISTOR	1	
Q8		2SD751	TRANSISTOR	1	
Q9		2SC2497	TRANSISTOR	1	
Q10		2SD639	TRANSISTOR	1	
			RESISTORS		
R1		ERF10HKR39B	W.RESISTOR 10W 0.39	1	
R3		ERG2SJ221	M.RESISTOR 2W 220	1	
R4,R5		ERG3SJ222	M.RESISTOR 3W 2.2K	2	
R6,R7		ERG2SJ104	M.RESISTOR 2W 100K	2	
R8,R9		ERG2SJ100	M.RESISTOR 2W 10	2	
R10,11		ERG2SJ100	M.RESISTOR 2W 10	2	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R12		ERX1SJ1R5	M.RESISTOR 1W 1.5	1	
R13		ERX1SJ1R5U	M.RESISTOR 1W 1.5	1	
R14,15		ERD50FJ224	C.RESISTOR 1/2W 220K	2	
R34,35		ERG2SJ100	M.RESISTOR 2W 10	2	
R36		ERG3SJ821	M.RESISTOR 3W 820	1	
R37		ERG1SJ471U	M.RESISTOR 1W 470	1	
R38,39		ERF2AJR10	W.RESISTOR 2W 0.1	2	
R40		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R41		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R42		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
T1		VLT0313	TRANSFORMER	1	
T2		VLT0314	TRANSFORMER	1	
VR1		VRV0110B502	V.RESISTOR 5K	1	
			MISCELLANEOUS		
		VHN0059	NYLON NUT	6	
		VJR0068	PIN	5	
		VJR0233	PIN	1	
		VMP0951	P.C.B.HOLDER ANGLE	1	
		VMP0952	P.C.B.HOLDER ANGLE	1	
		VMZ0730	BARRIER	3	
		VMZ0986	BARRIER	1	
		VMZ1215	BARRIER	1	
		VMZ1223	BARRIER	1	
		VMZ1305	BARRIER	4	
		VSC1735	SHIELD CASE	1	
		VSC2845	SHIELD CASE	1	
		XSS3+8S	SCREW	7	
		XYN3+F8S	SCREW	4	
	■	VEP80067A	P.C.BOARD W/COMPONENT		PART OF VEP81014A
			SUB2 (P2)		
D24		RD10EB2	ZENER 10V	1	
Q10		2SD639	TRANSISTOR	1	
			RESISTORS		
R40		ERDS2TJ182	C.RESISTOR 1/4W 1.8K	1	
R41		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R42		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
VR1		VRV0064B502	V.RESISTOR 5K	1	
			MISCELLANEOUS		
		VJR0233	PIN	1	
	■	VEP81037A	P.C.BOARD W/COMPONENT		FOR AU-630
			SWITCHING POWER 2		

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
			CAPACITORS		
C101		ECQF6222KZ	P.CAPACITOR 630V 2200P	1	
C102		ECQP1222JZ	P.CAPACITOR 100V 2200P	1	
C103-06		ECEA1VFE222	E.CAPACITOR 35V 2200U	4	
C107		ECEA1CF471	E.CAPACITOR 16V 470U	1	
C108		ECQM1H103KV	P.CAPACITOR 50V 0.01U	1	
C109		ECQP1222JZ	P.CAPACITOR 100V 2200P	1	
C110-13		ECEA1CF102	E.CAPACITOR 16V 1000U	4	
C114		ECQP1222JZ	P.CAPACITOR 100V 2200P	1	
C115,16		ECEA1CF222	E.CAPACITOR 16V 2200U	2	
C117		ECEA1CF471	E.CAPACITOR 16V 470U	1	
C118		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C119		ECQM1H272JV	P.CAPACITOR 50V 2700P	1	
C120		ECQM1H563JV	P.CAPACITOR 50V 0.056U	1	
C121		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C122		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C123		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
D101		ESAC33-02CS	DIODE	1	
D102		ESAC31-02N	DIODE	1	
D103		ERC25-04	DIODE	1	
D104		RD6.8EB2	ZENER 6.8V	1	
D105		ESAC25-02C	DIODE	1	
D106		ESAC31-02N	DIODE	1	
D107		ESAD83-004	DIODE	1	
D108		ERC25-04	DIODE	1	
D109		MA165	DIODE	1	
D111		MA165	DIODE	1	
D112		RD3.6EB2	ZENER 3.6V	1	
D113-15		MA165	DIODE	3	
IC101		UPC358C	IC	1	
L101		VLT0315	TRANSFORMER	1	
L102		VLQ0239	COIL	1	
L103		VLQ0240	COIL	1	
L104		VTQ0041	COIL	1	
L105		VLT0316	TRANSFORMER	1	
L106,07		VLQ0241	COIL	2	
L108		VLT0311	TRANSFORMER	1	
L109		VLQ0237	COIL	1	
L110		VTQ0041	COIL	1	
P212		VJP1149	CONNECTOR(MALE)	1	
P213		VJP1558	CONNECTOR(MALE)	1	
P214		VJP1561	CONNECTOR(MALE)	1	
P215,16		VJP1149	CONNECTOR(MALE)	2	
Q101		2SC2331	TRANSISTOR	1	
Q102,03		2SD639	TRANSISTOR	2	
Q104		2SC2331	TRANSISTOR	1	
Q105		2SD639	TRANSISTOR	1	
Q106		DTC114EA	TRANSISTOR RESISTOR	1	
			RESISTORS		
R101,02		ERG2SJ100	M.RESISTOR 2W 10	2	
R103		ERG3SJ221	M.RESISTOR 3W 220	1	
R104		ERG3SJ821	M.RESISTOR 3W 820	1	
R105		ERG1SJ150	M.RESISTOR 1W 15	1	
R106		ERG1SJ101	M.RESISTOR 1W 100	1	
R107		EYP2BR109	FUSE	1	
R108		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R109,10		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R111		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R112,13		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R114		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R115		ERG3SJ221	M.RESISTOR 3W 220	1	
R116		ERG3SJ821	M.RESISTOR 3W 820	1	
R117		ERX2SJ4R7	M.RESISTOR 2W 4.7	1	
R118		ERG3SJ821	M.RESISTOR 3W 820	1	
R119		ERX1SJ1R0	M.RESISTOR 1W 1	1	
R121		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R122		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R123		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R124,25		ERDS2TJ123	C.RESISTOR 1/4W 12K	2	
R126		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R127		ERDS2TJ390	C.RESISTOR 1/4W 39	1	
R128		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R129		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R130		ERDS2TJ820	C.RESISTOR 1/4W 82	1	
R131		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R132		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R133		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R134		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R135		ERG1SJ101	M.RESISTOR 1W 100	1	
R150		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
T101		VLT0317	TRANSFORMER	1	
T102		VLT0318	TRANSFORMER	1	
VR101,02		VRV0110B202	V.RESISTOR 2K	2	
			MISCELLANEOUS		
		VHN0059	NYLON NUT	6	
		VJR0068	PIN	2	
		VJR0162	PIN	1	
		VJR0233	PIN	1	
		VMP0953	P.C.B.HOLDER ANGLE	1	
		VMP0954	P.C.B.HOLDER ANGLE	1	
		VMP0955	P.C.B.HOLDER ANGLE	1	
		VMZ0730	BARRIER	1	
		VMZ1222	BARRIER	2	
		VMZ1376	BARRIER	1	
		VSC1736	SHIELD CASE	1	
		VSC1737	SHIELD CASE	1	
		XSS3+8S	SCREW	9	
		XYN3+F8S	SCREW	5	
	■	VEP80068A	P.C.BOARD W/COMPONENT		PART OF VEP81015A
			SUB (P1)		
			CAPACITORS		
C108		ECQM1H103KV	P.CAPACITOR 50V 0.01U	1	
D104		RD6.8EB2	ZENER 6.8V	1	
Q102,03		2SD639	TRANSISTOR	2	
			RESISTORS		

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R108		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R109,10		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	2	
R111		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R112,13		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R114		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R150		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
VR101		VRV0064B202	V.RESISTOR 2K	1	
			MISCELLANEOUS		
		VJR0233	PIN	1	
	■	VEP80069A	P.C.BOARD W/COMPONENT		PART OF VEP81015A
			SUB2 (P2)		
			CAPACITORS		
C118		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C119		ECQM1H272JV	P.CAPACITOR 50V 2700P	1	
C120		ECQM1H563JV	P.CAPACITOR 50V 0.056U	1	
C121		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
C122		ECEA1CU100	E.CAPACITOR 16V 10U	1	
C123		ECEA0JU101	E.CAPACITOR 6.3V 100U	1	
D109		MA165	DIODE	1	
D111		MA165	DIODE	1	
D112		RD3.6EB2	ZENER 3.6V	1	
D113-15		MA165	DIODE	3	
IC101		UPC358C	IC	1	
Q105		2SD639	TRANSISTOR	1	
Q106		DTC114EA	TRANSISTOR RESISTOR	1	
			RESISTORS		
R121		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R122		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R123		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R124,25		ERDS2TJ123	C.RESISTOR 1/4W 12K	2	
R126		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R127		ERDS2TJ390	C.RESISTOR 1/4W 39	1	
R128		ERDS2TJ122	C.RESISTOR 1/4W 1.2K	1	
R129		ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R130		ERDS2TJ820	C.RESISTOR 1/4W 82	1	
R131		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R132		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R133		ERDS2TJ392	C.RESISTOR 1/4W 3.9K	1	
R134		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
VR102		VRV0064B202	V.RESISTOR 2K	1	
			MISCELLANEOUS		
		VJR0162	PIN		

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP80081E	P.C.BOARD W/COMPONENT		
			AUDIO VR		
			CAPACITORS		
C1		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C2		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C3		ECEA1CU101	E.CAPACITOR 16V 100U	1	
C4		ECEA1CU470	E.CAPACITOR 16V 47U	1	
IC1,C2		UPC4558C	IC	2	
IC3,C4		AN6558	IC	2	
P117		VJP1145	CONNECTOR(MALE)	1	
P118-21		VJP1141	CONNECTOR(MALE) 2P	4	
P125		VJP1142	CONNECTOR(MALE)	1	
P127		VJP1145	CONNECTOR(MALE)	1	
P129-31		VJP1145	CONNECTOR(MALE)	3	
P132		VJP1188	CONNECTOR(MALE)	1	
P152		VJP1142	CONNECTOR(MALE)	1	
Q1		2SD638	TRANSISTOR	1	
Q2		2SB643	TRANSISTOR	1	
			RESISTORS		
R2		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R4		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R6		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R8		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R11		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R12		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R15		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R16		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R19		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R20		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R23		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R24		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R25,26		ERDS2TJ331	C.RESISTOR 1/4W 330	2	
R28		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R30		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R32		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R34		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
VR2		VRV0109B103	V.RESISTOR 10K	1	
VR4		VRV0109B103	V.RESISTOR 10K	1	
VR6		VRV0109B103	V.RESISTOR 10K	1	
VR8		VRV0109B103	V.RESISTOR 10K	1	
VR10		EVU013020A14	V.RESISTOR 10K	1	
VR12		EVU013020A14	V.RESISTOR 10K	1	
VR14		EVU013020A14	V.RESISTOR 10K	1	
VR16		EVU013020A14	V.RESISTOR 10K	1	
			MISCELLANEOUS		
		VMP0959	P.C.B.HOLDER ANGLE	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP80083A	P.C.BOARD W/COMPONENT		
			METER SELECT		
SW1		VSS0183	SWITCH	1	
	■	VEP80420A	P.C.BOARD W/COMPONENT		
			PCM LED		
D1		MU035201	DIODE	1	
P200		VJP1141	CONNECTOR(MALE) 2P	1	
			RESISTORS		
R1		ERDS2TJ181	C.RESISTOR 1/4W 180	1	
	■	VEP80422A	P.C.BOARD W/COMPONENT		
			AUTO OFF LED		
D1		VLL0029	LED	1	
P112		VJP1188	CONNECTOR(MALE)	1	
P113		VJP1141	CONNECTOR(MALE) 2P	1	
P115		VJP1188	CONNECTOR(MALE)	1	
			RESISTORS		
R1		ERDS2TJ390	C.RESISTOR 1/4W 39	1	
	■	VEP80232A	P.C.BOARD W/COMPONENT		
			EJECT SW		
LED1		VLL0024	LED	1	
			RESISTORS		
R1		ERDS2TJ271	C.RESISTOR 1/4W 270	1	
SW1		VSP0221	SWITCH	1	
	■	VEP80333A	P.C.BOARD W/COMPONENT		
			METER LAMP		

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
LED1-D9		VLL0048	LED	9	
LED10-16		VLL0048	LED	7	
P100		VJP1149	CONNECTOR(MALE)	1	
			RESISTORS		
R1-R4		ERDS1TJ681	C.RESISTOR 1/2W 680	4	
			MISCELLANEOUS		
		KL04	LED SPACER		
	■	VEP86075B	P.C.BOARD W/COMPONENT		
			FRONT A		
			CAPACITORS		
C1-C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	9	
C10		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C11		ECEA1AU221	E.CAPACITOR 10V 220U	1	
D1-D9		MA165	DIODE	9	
D10-33		MA165	DIODE	24	
IC1		MC74HC138N	IC	1	
IC2-C7		MC74HC374N	IC	6	
IC8		MC74HC154N	IC	1	
IC9		MC74HC541N	IC	1	
IC10		MC74HC541N	IC	1	
IC11-13		AN6873N	IC	3	
IC14-18		M54514AP	IC	5	
J2		VJP1233T	CONNECTOR(MALE) 6P	1	
J3		VJP1235T	CONNECTOR(MALE) 8P	1	
J4,J5		VJP1239T	CONNECTOR(MALE) 12P	2	
LED1-D8		LN340GCPGLS	DIODE	8	
LED11-14		LN340GCPGLS	DIODE	4	
LED15,16		AYBG5305S	LED	2	
LED17		LN217RP	LED	1	
LED18		EBG5504S	LED	1	
LED19-34		LN317GPU	DIODE	16	
Q1-Q4		2SD636	TRANSISTOR	4	
Q6,Q7		2SD636	TRANSISTOR	2	
Q8		2SB641	TRANSISTOR	1	
Q9		DTC114EA	TRANSISTOR RESISTOR	1	
Q10,11		2SB643	TRANSISTOR	2	
Q12		2SB641	TRANSISTOR	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
			RESISTORS		
R1-R8		ERDS2TJ151	C.RESISTOR 1/4W 150	8	
R11,12		ERDS2TJ221	C.RESISTOR 1/4W 220	2	
R13-16		ERDS2TJ151	C.RESISTOR 1/4W 150	4	
R17		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R18		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R19		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R20		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R21		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R22,23		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R24		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R27		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R28,29		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R30		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R31		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R32		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R33		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R34		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R35		ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R36		ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R37,38		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R39		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R40		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R41		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R42		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R43		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	1	
R44		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R45,46		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
RA1-A5		EXBC44151J	RESISTOR & RESISTOR 150	5	
RA6,A7		EXBC44391J	RESISTOR & RESISTOR 390	2	
SW1-W4		VSP0199	SWITCH	4	
SW5		VSP0193	SWITCH	1	
SW6		VSP0195	SWITCH	1	
SW7		VSP0224	SWITCH	1	
SW8		VSP0279	SWITCH	1	
SW9		VSP0223	SWITCH	1	
SW10		VSP0199	SWITCH	1	
SW11		VSP0214	SWITCH	1	
SW12		VSP0461	SWITCH	1	
SW13-16		VSP0199	SWITCH	4	
SW17		VSP0198	SWITCH	1	
SW18		VSP0214	SWITCH	1	
SW19		VSP0198	SWITCH	1	
SW20		VSP0459	SWITCH	1	
SW21		VSP0458	SWITCH	1	
SW22		VSP0199	SWITCH	1	
SW23-25		VSP0198	SWITCH	3	
SW26		VSP0239	SWITCH	1	
SW27		VSP0225	SWITCH	1	
SW28,29		VSS0172	SWITCH	2	
SW30-32		EVQQ6R13K	SWITCH	3	
SW33		VSS0172	SWITCH	1	
			MISCELLANEOUS		
		VGF0191	SEARCH LED COVER	1	
		VGF0240	LED HOLDER	6	
		VHN0060	NYLON NUT	6	
		VJF0344	LED HOLDER	1	
		VJF0345	LED HOLDER	1	
		VMX0473	DISPLAY SPACER	1	
		VMX1606	DISPLAY SPACER	1	
		VMZ0829	BARRIER	1	
		VSL0120	DISPLAY TUBE	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP86076B	P.C.BOARD W/COMPONENT		
			FRONT B		
BZ1		VSQ0558	BUZZER	1	
			CAPACITORS		
C1,C2		ECCF1H330JC	C.CAPACITOR 50V 33P	2	
C3-C5		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C6		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C7		ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C8,C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C10-13		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C15-17		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	3	
C18		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C19		ECEA1AKS101	E.CAPACITOR 10V 100U	1	
C20		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C21		ECEA1AKS101	E.CAPACITOR 10V 100U	1	
C22-25		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	4	
C26		ECEA1AKS101	E.CAPACITOR 10V 100U	1	
C27		ECEA1AKA221	E.CAPACITOR 10V 220U	1	
C28		ECQM1H102JV	P.CAPACITOR 50V 1000P	1	
C29		ECEA1HU470	E.CAPACITOR 50V 47U	1	
C30,31		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	
C32		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C33		ECQM1H332JV	P.CAPACITOR 50V 3300P	1	
C34		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C35		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C36		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C37,38		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C48-56		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	9	
D1		MA185	DIODE	1	
D2		MA1220-M	DIODE	1	
D3		MA4075	DIODE	1	
D4-D9		MA165	DIODE	6	
D10-15		MA165	DIODE	6	
D16		1SS101	DIODE	1	
D17		MA165	DIODE	1	
D18		1SS101	DIODE	1	
IC1		MC74HC74F	IC	1	
IC2		MC74HC161F	IC	1	
IC3		TL7705CPB	IC	1	
IC4		TMPZ84C00AP6	IC	1	
IC5,C6		MC74HC541N	IC	2	
IC7		VSI0392	IC	1	
IC8		HM6264LP12	IC	1	
IC9		MC74HC139F	IC	1	
IC10		MC74HC138F	IC	1	
IC11		TMPZ84C40AP6	IC	1	
IC12		TMPZ84C30AP6	IC	1	
IC13		TMP82C79F2	IC	1	
IC14		MC74HC138F	IC	1	
IC15		TMP82C55AP2	IC	1	
IC16		MC14015BF	IC	1	
IC17		MC14013BF	IC	1	
IC18,19		MC14516BF	IC	2	
IC20		MC14049UBF	IC	1	
IC21		MC14073BF	IC	1	
IC22		SN74LS38NS	IC	1	
IC23		MC74HC132F	IC	1	
IC24		MC74HCU04F	IC	1	
IC25		MC74HC04F	IC	1	
IC26		MC74HC32N	IC	1	
IC27		MC14001BCP	IC	1	
IC28		MC74HC00N	IC	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
IC4S		VJS2336A040	CONNECTOR (FEMALE)	1	
IC7S		VJS2336A028	CONNECTOR (FEMALE)	1	
J1		VJP1145	CONNECTOR(MALE)	1	
J2		VJP1246T	CONNECTOR(MALE) 6P	1	
J3		VJP1248T	CONNECTOR(MALE) 8P	1	
J4,J5		VJP1252T	CONNECTOR(MALE) 12P	2	
L1,L2		VLP0017	COIL	2	
L3		VTD0035	COIL	1	
P150		VJP1976	CONNECTOR(MALE)	1	
Q1		2SD946A	TRANSISTOR	1	
Q2,Q3		2SB641	TRANSISTOR	2	
Q4		2SD1051	TRANSISTOR	1	
Q5-Q7		UN1214	TRANSISTOR-RESISTOR	3	
Q8		UN1212	TRANSISTOR-RESISTOR	1	
Q9		UN1214	TRANSISTOR-RESISTOR	1	
Q10		2SD636	TRANSISTOR	1	
			RESISTORS		
R1		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R2		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R3		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R4		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R5		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R6		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R7		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R8		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R9		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R10		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R11		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R12		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R13		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R14		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R15		ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R16		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R17		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R18		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R19-21		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
R22		ERDS2TJ473	C.RESISTOR 1/4W 47K	1	
R23		ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
R24		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R25		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R26		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R27		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R28		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R29		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R30,31		ERDS2TJ102	C.RESISTOR 1/4W 1K	2	
RA1,A2		EXBR88223J	COMBI. R-R	2	
SW1		VSR0045	SWITCH	1	
SW2		VSS023708	SWITCH	1	
TP3-P8		VJR0400Y	TEST POINT	6	
TPG1,G2		VJR0400B	TEST POINT	2	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR1		VRV0109B103	V.RESISTOR 10K	1	
VR2		VRV0109B503	V.RESISTOR 50K	1	
X1		VSX0150	CRYSTAL OSCILLATOR	1	
	■	VEP80108A	P.C.BOARD W/COMPONENT		
			HEAD PHONE		
P109		VJP1143	CONNECTOR(MALE)	1	
			MISCELLANEOUS		
		VJJ0150	HEADPHONE JACK	1	
	■	VEP80311D	P.C.BOARD W/COMPONENT		
			CONTROL SW		
			CAPACITORS		
C1,C2		ECEA1CU101	E.CAPACITOR 16V 100U	2	
D1,D2		VLL0047	DIODE	2	
D1S		VMX0768	DIODE	1	
D2S		VMX0768	DIODE	1	
D1S1,S2		VMX0768	DIODE	2	
D2S1,S2		VMX0768	DIODE	2	
IC1		UPC4557C	IC	1	
IC2		UPD5200C	IC	1	
P103		VJP1143	CONNECTOR(MALE)	1	
P110		VJP1144	CONNECTOR(MALE)	1	
P151		VJP1146	CONNECTOR(MALE) 10P	1	
P153,54		VJP1144	CONNECTOR(MALE)	2	
P155		VJP1143	CONNECTOR(MALE)	1	
Q1		2SD636	TRANSISTOR	1	
Q2		UN1213	TRANSISTOR-RESISTOR	1	
Q3		2SD636	TRANSISTOR	1	
Q4		UN1213	TRANSISTOR-RESISTOR	1	
			RESISTORS		
R1,R2		ERDS2TJ101	C.RESISTOR 1/4W 100	2	
R3		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R4,R5		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R6-R9		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R101		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R102		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R103		ERDS2TJ560	C.RESISTOR 1/4W 56	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R104		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R201		ERDS2TJ152	C.RESISTOR 1/4W 1.5K	1	
R202		ERDS2TJ153	C.RESISTOR 1/4W 15K	1	
R203		ERDS2TJ560	C.RESISTOR 1/4W 56	1	
R204		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
SW1		VST0079	SWITCH	1	
SW2		VST0080	SWITCH	1	
SW6		VST0080	SWITCH	1	
	■	VEP80410B	P.C.BOARD W/COMPONENT		
			CONTROL VR		
			CAPACITORS		
C1		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C6		ECEA1AK101	E.CAPACITOR 10V 100U	1	
C7		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C8		ECEA1AK101	E.CAPACITOR 10V 100U	1	
C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C24		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C25		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C26,27		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C38		ECEA0JK221	E.CAPACITOR 6.3V 220U	1	
C39,40		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	2	
C42		ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C43		ECEA1HK010	E.CAPACITOR 50V 1U	1	
C102		ECEA1CK101	E.CAPACITOR 16V 100U	1	
C103		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C104		ECEA1CK101	E.CAPACITOR 16V 100U	1	
C105		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
D1-D5		MA165	DIODE	5	
D103,04		VLL0027	LED	2	
D112-17		VLL0027	LED	6	
D103S		VMX0768	DIODE	1	
D104S		VMX0768	DIODE	1	
D112S		VMX0768	DIODE	1	
D113S		VMX0768	DIODE	1	
D114S		VMX0768	DIODE	1	
D115S		VMX0768	DIODE	1	
D116S		VMX0768	DIODE	1	
D117S		VMX0768	DIODE	1	
IC1		MC74HC157F	IC	1	
IC2-C4		MC14053BF	IC	3	
IC10		HD74147P	IC	1	
IC11		UPD4175BG	IC	1	
IC12		UPD4028BG	IC	1	
IC13		M54517P	IC	1	
IC15		TL7705CPB	IC	1	
IC16		UPD4012BG	IC	1	
L3,L4		VLQEL06F220K	COIL 220UH	2	
L18		VLQEL06F101J	COIL 100UH	1	
L101,02		VLQEL06F220K	COIL 220UH	2	
P101		VJP1147	CONNECTOR(MALE)	1	
P106		VJP1146	CONNECTOR(MALE) 10P	1	
P107		VJP2349	CONNECTOR (MALE)	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
P108		VJP1146	CONNECTOR(MALE) 10P	1	
Q1		DTC124EA	TRANSISTOR RESISTOR	1	
Q2,Q3		2SD636	TRANSISTOR	2	
Q4		UN1213	TRANSISTOR-RESISTOR	1	
Q5		2SD638	TRANSISTOR	1	
Q6		UN1213	TRANSISTOR-RESISTOR	1	
Q7		2SD638	TRANSISTOR	1	
			RESISTORS		
R47,48		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	2	
R49		ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R50		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R51		ERDS2TJ393	C.RESISTOR 1/4W 39K	1	
R52-54		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	3	
R55		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R62,63		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R64		ERDS2TJ472	C.RESISTOR 1/4W 4.7K	1	
R65,66		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R67		ERDS2TJ104	C.RESISTOR 1/4W 100K	1	
R68		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R101-04		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R107-18		ERDS2TJ103	C.RESISTOR 1/4W 10K	12	
R119,20		ERDS2TJ151	C.RESISTOR 1/4W 150	2	
R121-24		ERDS2TJ682	C.RESISTOR 1/4W 6.8K	4	
R127-30		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R135,36		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R164-69		ERDS2TJ151	C.RESISTOR 1/4W 150	6	
RA1		EXBP85223K	RESISTOR&RESISTOR 22K	1	
RA2		EXBP87103K	RESISTOR&RESISTOR 10K	1	
RA3		EXBP85103K	RESISTOR&RESISTOR 10K	1	
RA4		EXBP84102K	COMBI.R-R 10K	1	
RA5		EXBP85102K	COMBI.R-R 33K	1	
SW2-W7		EVQQJ104K	SWITCH	6	
SW8		ESD32184	SWITCH	1	
SW9		VSR0031	VOLTAGE SELECT SWITCH	1	
SW10,11		EVQQJ104K	SWITCH	2	
SW12		VSR0031	VOLTAGE SELECT SWITCH	1	
VR1,R2		EVUF3AS01B53	V.RESISTOR 5K	2	
VR4-R7		EVUF3AE20B53	V.RESISTOR 5K	4	
VR8,R9		EVUF3AS01B53	V.RESISTOR 5K	2	
VR11,12		EVUF3AS01B53	V.RESISTOR 5K	2	
VR13-15		EVUF3AE20B53	V.RESISTOR 5K	3	
			MISCELLANEOUS		
		VJF0300	BINDER	3	
	■	VEP80316A	P.C.BOARD W/COMPONENT		
			CHASSIS CONNECTION		
			CAPACITORS		
C1-C6		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	6	
C7		ECKF1H331KB	C.CAPACITOR 50V 330P	1	
C8,C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C10		ECQM1H103JV	P.CAPACITOR 50V 0.01U	1	
C11		ECEA1CU470	E.CAPACITOR 16V 47U	1	
C12-24		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	13	
IC1,C2		MC14021BF	IC	2	
IC3		UPC393G	IC	1	<R>
IC4		UPD4584BG	IC	1	
IC5		UPD4050BG	IC	1	
P401		VJP1145	CONNECTOR(MALE)	1	
P402		VJP1142	CONNECTOR(MALE)	1	
P404,05		VJP1142	CONNECTOR(MALE)	2	
P408		VJP1229T	CONNECTOR(MALE) 2P	1	
P428-32		VJP1142	CONNECTOR(MALE)	5	
P437,38		VJP1142	CONNECTOR(MALE)	2	
P439		VJP1141	CONNECTOR(MALE) 2P	1	
P444		VJP1142	CONNECTOR(MALE)	1	
P451		VJP1146	CONNECTOR(MALE) 10P	1	
P452		VJP1144	CONNECTOR(MALE)	1	
P455		VJP1144	CONNECTOR(MALE)	1	
P456		VJP1145	CONNECTOR(MALE)	1	
P459		VJP1188	CONNECTOR(MALE)	1	
P461		VJP1143	CONNECTOR(MALE)	1	
P462,63		VJP1142	CONNECTOR(MALE)	2	
P464		VJP1188	CONNECTOR(MALE)	1	
Q1		2SK128	TRANSISTOR	1	
			RESISTORS		
R1,R2		ERDS2TJ123	C.RESISTOR 1/4W 12K	2	
R3-R8		ERDS2TJ103	C.RESISTOR 1/4W 10K	6	
R9		ERDS2TJ274	C.RESISTOR 1/4W 270K	1	
R10		ERDS2TJ274	C.RESISTOR 1/4W 270K	1	
R11		ERDS2TJ223	C.RESISTOR 1/4W 22K	1	
R12		ERDS2TJ333	C.RESISTOR 1/4W 33K	1	
R13,14		ERDS2TJ103	C.RESISTOR 1/4W 10K	2	
R15,16		ERDS2TJ181	C.RESISTOR 1/4W 180	2	
R17		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R18		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R19,20		ERDS2TJ223	C.RESISTOR 1/4W 22K	2	
R21-24		ERDS2TJ103	C.RESISTOR 1/4W 10K	4	
R25		ERDS2TJ222	C.RESISTOR 1/4W 2.2K	1	
R26		ERDS2TJ475	C.RESISTOR 1/4W 4.7M	1	
R27		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R28		ERDS2TJ105	C.RESISTOR 1/4W 1000K	1	
R29-40		ERDS2TJ103	C.RESISTOR 1/4W 10K	12	
R41-43		ERDS2TJ123	C.RESISTOR 1/4W 12K	3	
R44		ERDS2TJ181	C.RESISTOR 1/4W 180	1	
R46		ERDS2TJ181	C.RESISTOR 1/4W 180	1	
R47		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R48		ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
R49-51		ERDS2TJ103	C.RESISTOR 1/4W 10K	3	
	■	VEP80468A	P.C.BOARD W/COMPONENT		
			REF IN		
			CAPACITORS		
C1		ECEA1CK101	E.CAPACITOR 16V 100U	1	
C2		ECEA1CK101	E.CAPACITOR 16V 100U	1	
C3		ECEA1EKN4R7	E.CAPACITOR 25V 4.7U	1	
C4		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C5		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C6		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C7		ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C8		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C9		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C10		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C11		ECCF1H220JC	C.CAPACITOR 50V 22P	1	
C12		ECEA1CKN330	E.CAPACITOR 16V 33U	1	
C13		ECEA1CKN330	E.CAPACITOR 16V 33U	1	
C14		ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C15		ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C16		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
C17		ECKF1H103ZF	C.CAPACITOR 50V 0.01U	1	
D1		MA165	DIODE	1	
IC1		UPC4558C	IC	1	
IC2		BA7001	IC	1	
IC3		NE5534N	IC	1	
IC4		NE5534N	IC	1	
L1		VLQEL05F221J	COIL 220UH	1	
L2		VLQEL05F221J	COIL 220UH	1	
P301		VJP1146	CONNECTOR(MALE)	1	
Q1		UN1213	TRANSISTOR-RESISTOR	1	
Q2		2SA1005	TRANSISTOR	1	
Q3		2SC2188	TRANSISTOR	1	
			RESISTORS		
R1		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R2		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R3		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R4		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R7		ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R8		EROS2TKF6801	C.RESISTOR 1/4W 6.8K	1	
R9		EROS2TKF3301	M.RESISTOR 1/4W 3.3K	1	
R10		EROS2TKF3301	M.RESISTOR 1/4W 3.3K	1	
R11		EROS2TKF8201	M.RESISTOR 1/4W 8.2K	1	
R12		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R13		EROS2CKF9101	M.RESISTOR 1/4W 9.1	1	
R14		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	1	
R15		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R16		EROS2CHD75R0	M.RESISTOR 1/4W 75.0	1	
R17		ERDS2TJ101	C.RESISTOR 1/4W 100	1	
R18		ERDS2TJ332	C.RESISTOR 1/4W 3.3K	1	
R19		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R20		ERDS2TJ470	C.RESISTOR 1/4W 47	1	
R21		ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R22		ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R23		EROS2CKF1501	M.RESISTOR 1/4W 1.5K	1	
R24		EROS2CKF8201	M.RESISTOR 1/4W 8.2K	1	
R25		EROS2CKF3301	M.RESISTOR 1/4W 3.3K	1	
SW1		VSS0119	SWITCH	1	
W1		ERDS2T0	C.RESISTOR 1/4W 0	1	
	■	VEP80440A	P.C.BOARD W/COMPONENT		
			FRONT LOADING		
		VJP1154	CONNECTOR	1	
		VJP1246T	CONNECTOR	1	
		VJP1249T	CONNECTOR	1	
	■	VEP00E30A	P.C.BOARD W/COMPONENT		
			CASSETTE DETECT SWITCH		
		ERDS2TJ181	C.CESISTOR 1/4W 180	1	
		ON1110R	PHOTO INTERRUPTER	1	
	■	VEP00E72A	P.C.BOARD W/COMPONENT		
			MIRROR LAMP		
		VLL0019	PILOT LAMP	3	
	■	VEP00E04A	P.C.BOARD W/COMPONENT		
			LOADING PHOTO		
		ON1110R	PHOTO INTERRUPTER	1	
	■	VEP00E25A	P.C.BOARD W/COMPONENT		
			UNLOADING PHOTO		
		ON1110R	PHOTO INTERRUPTER	1	
	■	VEP00E27A	P.C.BOARD W/COMPONENT		
			TR SENSOR (1)		
		ON1110R	PHOTO INTERRUPTER	1	

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Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
	■	VEP00E28A	P.C.BOARD W/COMPONENT		
			TR SENSOR (2)		
		ON1110R	PHOTO INTERRUPTER	1	
			SERVICING FIXTURES & TOOLS		
		VFK0293	POST DRIVER	1	
		VFK0373	SPRING TENSION GAUGE	1	
		VFK0133	DIAL TORQUE GAUGE	1	
		VFK0134	ADAPTOR FOR VFK0133	1	
		VFK0357	ECCENTRIC SCREWDRIVER	1	(1.5MM)
		VFK0358	ECCENTRIC SCREWDRIVER	1	(2MM)
		VFK0359	ECCENTRIC SCREWDRIVER	1	(3MM)
		VFK0446	FINE ADJ. SCREWDRIVER	1	
		VFK0326	HEX. WRENCH (SET)	1	
		VFK27	HEAD CLEANING STICK	1	
		VFK0363	POST HEIGHT FIXTURE	1	
		VFK0132	BACK TENSION METER	1	(TENTELOMETER)
		VFK0325	DIAL GAUGE	1	
		VFK0287	HEAD ADJ. PLATE	1	
		VFK0438	P2 POST TILT FXTURE	1	
		VFK0296	RT GAP SPACER	1	
		VFK0470	20PIN EXTENSION CABLE SET	1	
		VFK0361	DUMMY PLAG (1)	1	
		VFK0362	DUMMY PLAG (2)	1	
		VFM7180EG	ALIGNMENT TAPE	1	
		VFK66	FANTYPE TENSION GAUGE	1	
			CONNECTOR FOR ACCESARY		
		VJP1578	9P CONNECTOR (W/OUT CASE)	1	(REMOTE CONTROL)
		VJP0261	9P CONNECTOR (CASE ONLY)	1	(REMOTE CONTROL)
		VJS1922	12P CONNECTOR (F)	1	(COMPONENT/CTCM)
		VJP2106	50P CONNECTOR	1	(REMOTE CONTROL)

To guarantee the FUNCTION,SAFETY and RELIABLITY of repaired units,only use ORIGINAL REPLACEMENT PARTS which are listed with their part numbers in this parts list section.

Technical Description

(F)

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1–1. Introduction

The modern trend of broadcast studio Video Recording is shifting from those using 2–inch tape to those using 1–inch tape, and their functions are becoming more diversified. Noiseless slow motion by auto tracking in smaller formats is becoming very desirable. In the ENG/EFP Fields, VTRs are being reduced in size and are using modern 1/2 inch tape cassettes. Regarding studio VTRs, there has been an ever increasing desire for the reduction of VTR size, the use of cassette tape and cost savings from the view points of space, tape consumption, maneuverabisity, etc.

To accommodate these situations, we have developed the M II Format VTR and peripheral equip–ment in an attempt to meet the following targets:

Table 1 Target Specification of M II Format

1) Greater than 90 min. recording using 1/2 inch cassette tape.
2) Picture quality equivalent to that of present broadcasting VTRs.

In order to achieve these goals, we have established the target specification of Table 1, and have additionally targeted the functions mentioned following:

1) Sync and Burst level control on front.
2) Built–in TBC.
3) Noiseless slow motion [x(–1) – (+2)];
   Search picture in colour [x0 – (+–4)];
   Search picture in B/W [x(+–8 – +–32)]
4) 9–pin serial interface (RS–422 standard) and on board editing functions.
5) SMPTE OUT (Y, Pr, Pb)
6) Indicated DOLBY NR, SCH, CF, READY mode.
7) Y.C Demodu Out
8) Audio mix out.

We shall introduce the recording system, signal processing and other notable features of the M II Format in this report.

Item				Target specification
Recording time				97 min.
VIDEO	Frequency response	Y		5.5 MHz +0.5 dB -3
		C	R – Y	2 MHz +0.5 dB -3
			B – Y	2 MHz +0.5 dB -3
	SNR	Y		≥47 dB (Component)
		C	AM	≥48 dB (Component)
			PM	≥48 dB (Component)
	K factor			≤1.5%K(Y 2T),≤2%K (C 5T)
	DG			≤2%
	DP			≤2
	Linearity			≤3%
	Y/C delay			≤20 nsec
AUDIO	Logi-tudinal	SNR (at 3% distortion)		≥56dB (Dolby NR off) ≥60dB (Dolby NR on)
		Frequency response		40 ∿ 15000Hz +1.0dB/-2.0dB
	FM	Dinamic range		≥72dB (NOT WTD)
		Frequency response		20 ∿ 20000Hz +1.0/-2dB

Table 1 Target Specification of M II Format

1–2. Tape Format

In order to achieve the above–mentioned targets (recording time, frequency response, S/N ratio), we have established the format and its dimensions by total evaluation of the following items:

1) Tape length – tape thickness and cassette size
2) Relative speed – drum diameter
3) Track width
4) FM carrier frequency & deviation
5) Tape CNR (carrier to noise ratio)
6) High performance audio recording (PCM record–ing)–––AU–630 does not have PCM audio function.

PCM audio shares a common physical region on the tape with longitudinal audio CH1, which can be switched "off" for PCM recording or "on" for 2 channel (CH1, CH2) longitudinal audio recording. The PCM audio employs a system in which 2 channels can be separately recorded and edited. In the PCM Mode, the tape wrap angle around the drum is set at 216 degrees (video trailing over–lap, guard band, PCM tracks and additional guard band wrap angle = 30 degrees).
Figure 1–1 is the tape format of M II Format. (See next page).

1–2–1. Cassette, Tape, Heads

[Cassette]

For the determination of cassette size, we took into account the points of recording length and good maneuverability. We decided to employ a size near equivalent to the VHS cassette.

[Employment of metal particle tape, and amorphous heads]

To fulfill the requirements of high picture quality as well as 90 minute running time, and a near equivalent to the VHS cassette it was essential to raise the carrier–to–noise signal (CNR) of the tape. In this respect, we employed metal particle tape (13.5 um thick) that has excellent high frequency characteristics (output characteristics, CNR) and is able to ensure sufficient output for longitudinal track recording (audio, control, time code).
To use metal particle tape, we needed to employ amorphous heads as video heads to improve the playback signal to noise ratio. In this way, excellent characteristics were obtained in recording and playback.

Table 2 is the comparison of characteristics bet–ween SHG tape (high density iron oxide tape) and metal particle tape. Table 3 is the comparison of characteristics of video heads using metal particle tape. Due to the metal particle tape and amorphous heads, CNR can be improved by about 6 dB when compared to SHG tape.

Using the new tape and heads, greater reliability characteristics are obtained such as drop–out resistance and endurance.

		SHG tape	Metal particle tape
Magnetic property	Hc	670 Oe	1500 Oe
	Br	1050 Gauss	2470 Gauss
	Br/Bm	0.82	0.80
Frequency response	0.5 MHz	0 dB	+3.3 dB
	3.0 MHz	0 dB	+5.7 dB
	5.0 MHz	0 dB	+6.6 dB
CNR	fc = 5 MHz Δf = 1 MHz	0 dB	+5.9 dB

Table 2 Comparison between SHG and Metal Particle Tape

1-2-2. Frequency allocation, drum diameter, and other dimensions

In the M II Format VTR, we employed a separate Y/C track component recording system that ensures wide band luminance (Y) and chrominance (C) signals as well as excellent SNR (signal to noise ratio).
In this system, Y and C are separately recorded through FM modulation so that high quality pictures can be obtained at lower FM carrier frequencies as compared with direct FM recording. Signals of high SNR can be reproduced with a relatively small drum diameter. However, to achieve picture quality equivalent to present broadcast VTRs, relatively high FM carrier frequencies and relatively large drum diameters (relative speed) are required.
We set the FM frequency deviation of the luminance signal to 6-63-9-2MHz and that of the chrominance signal to 5.4-7.0MHz (at 100% color bar), intending to attain sufficient performance with respect to SNR, frequency band, and waveform reproducibility (related to white-dark clip).

Regarding drum diameter, it was set to 76mm to make the recording wave length approximately 0.65 um (PAL) at peak white. The recording wave length of the luminance signal is 0.89 um (sync tip) - 0.65 um (peak white). The recording wave length at white clip is 0.44 um (white clip 270%).

Table 4 is the comparison of main specifications between conventional systems and M II Format.

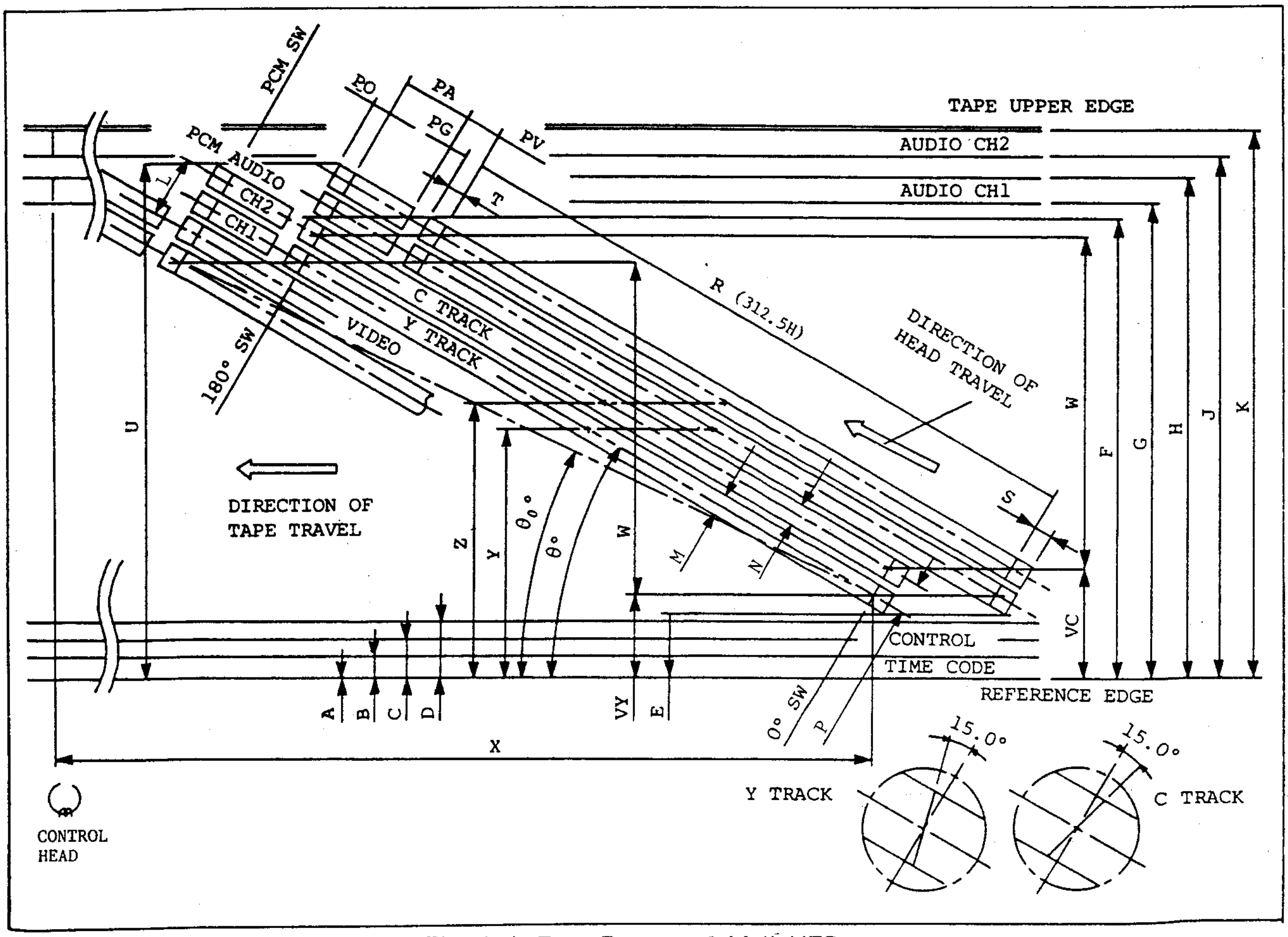


Fig. 1-1 Tape Format of M II VTR

Mark	Item	Nominal Value	Mark	Item	Nominal Value
A	Time code track lower edge	0 μm	W	Effective video width	8,847.1 μm
B	Time code track upper edge	450 μm	VY	Effective video width lower limit (Y track)	1,626 μm
C	Control track lower edge	900 μm		Effective video width lower limit (C track)	1,676 μm
D	Control track upper edge	1,300 μm	Y	Y track center height	6,050 μm
E	Video track lower edge	1,497 μm	Z	C track center height	6,099.5 μm
F	Video track upper edge	10,635 μm	θ	Video track angle	4.29770
G	Audio CH1 track lower edge	10,850 μm	PV	PCM audio recording point	2,703 μm
H	Audio CH1 track upper edge	11,450 μm	PG	Video PCM audio guard	1,351 μm
J	Audio CH2 track lower edge	11,950 μm	αH	H alignment	3.5 H
K	Audio CH2 track upper edge	12,550 μm	X	Control signal recording position	202,000 μm
L	Video track pitch	99.3μm		Tape to head relative speed	5.90 m
M	Y track width	56 μm		Time code track width	450 μm
N	C track width	36 μm		Control track width	400 μm
P	Y - C track pitch	49.7μm		Audio CH1 track width	600 μm
Q	Y - C track offset	4,533 μm		Audio CH2 track width	600 μm
R	Video track length	118,058.3μm		Tape travel speed	66.295mm/sec
S	Video leading overlap	1,333 μm			
T	Video trailing overlap	1,322 μm			

1–3. Tape Transport System

Figure 1–2 shows the tape transport system of the M II Format VTR. In order to assure stable travel of the thin metal particle tape at a speed ranging from 0 (still) – to x(+–32), the angle at which tape is wrapped around inclined fixed posts is minimized. All other guide posts are the rotating type, thereby reducing tape traveling load. Closed tension servo is applied to both supply and take–up reels to accurately control the tape tension and to prevent the tape from being damaged.

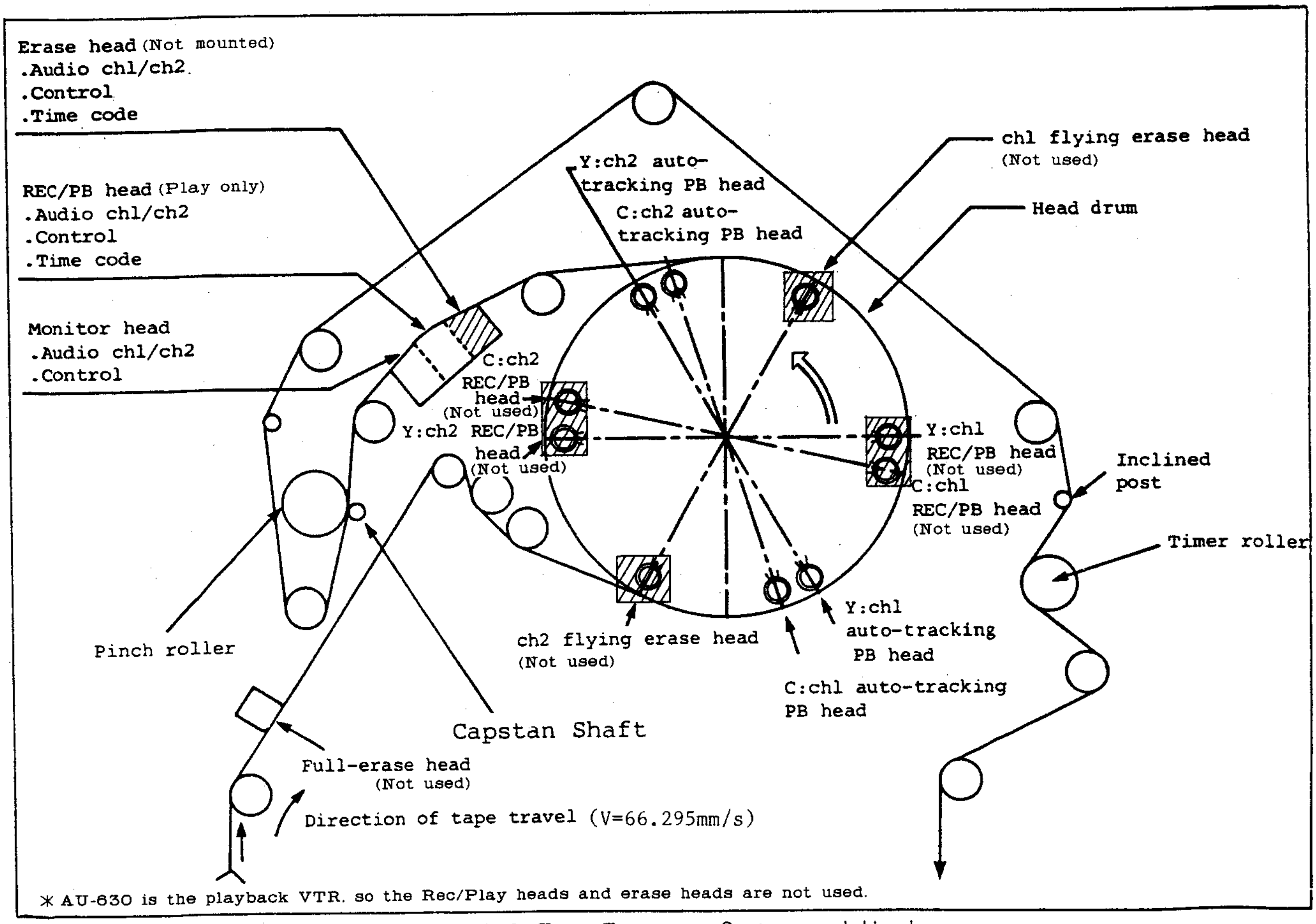


Fig. 1–2 Tape Transport System and Head Arrangement

1-4. Recording Method

1-4-1. Y/C separate track, chrominance time compressed multiplex (CTCM)

In M II Format, a Y/C separate track component recording system is employed in order to obtain high quality pictures in relation to small size.

Representative systems that can record two color difference signals on one track at a high SNR are those mentioned following: (Ref. 1 and 2)

1) The FM/FM frequency division multiplex system in which the scale of circuitry is small and the time axis error is limited.

2) The chrominance time-compressed multiplex system, (time axis compressed time division multiplex) that can make effective use of the frequency band.

For M II Format, we employed the chrominance time compressed multiplex (CTCM) system that can make the best use of the limited transmission band of head/tape. This system allows color signal bands of 1.5MHz for the two color difference signals. Taking into account use in common with PAL systems, Pr and Pb signals are selected as the two color difference signal components.

Figure 1-3 is a block diagram of the video signal process.

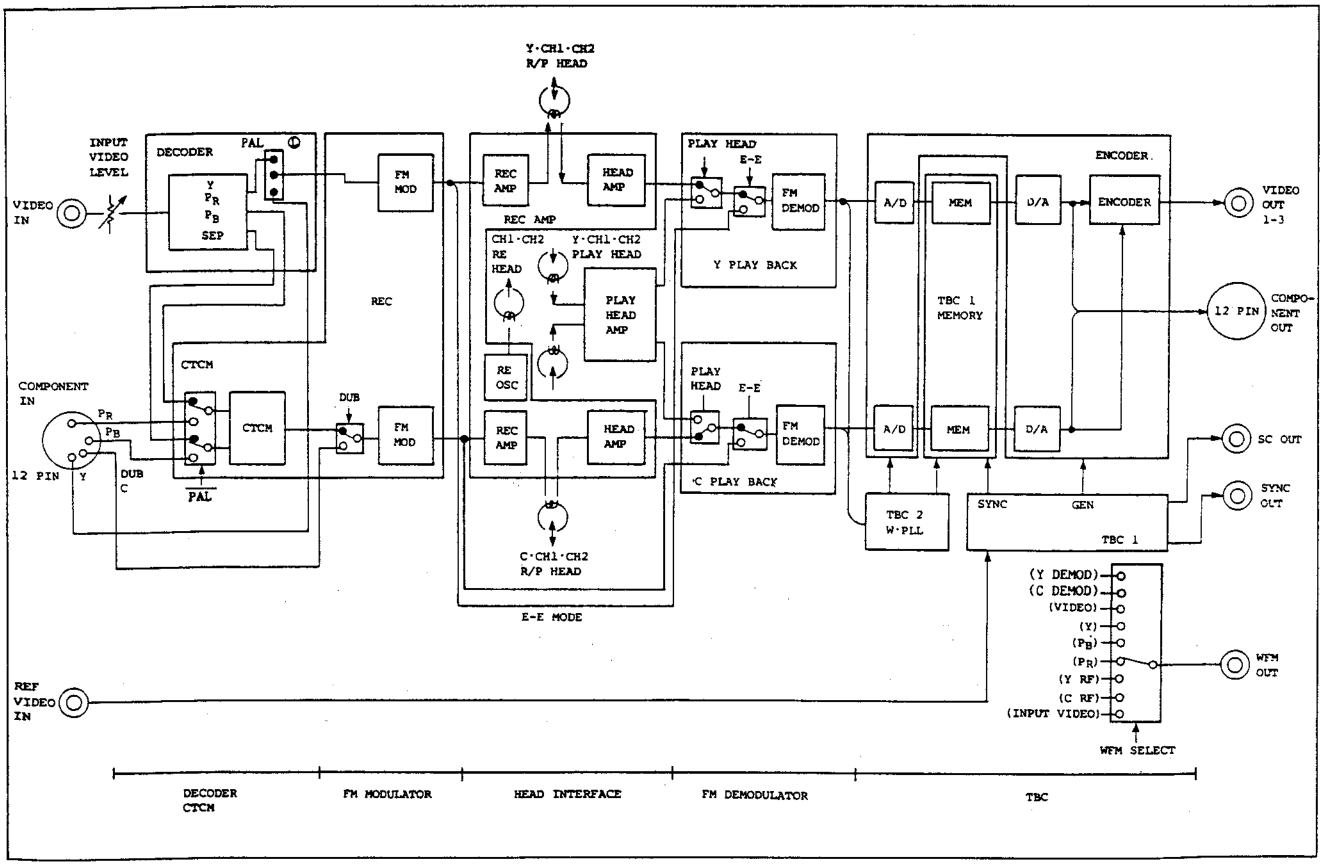


Fig. 1-3 Block Diagram of Video Signal Processing of AU-650B for reference of AU-630

1-4-2. Video signal recording and reproducing process

This process consists of the recording section where the luminance and CTCM signals are frequency-modulated and recorded on tape through the recording amplifiers and R/P heads, and the playback section where the signal reproduced by the R/P heads or play heads through head amplifiers is picked up and guided to DUB OUTPUTs and a TBC after demodulation. To obtain a playback signal of high SNR and waveform reproducibility, it adopts nonlinear emphasis to increase the amount of emphasis used for lower level signals in addition to the fixed main emphasis used before frequency modulation.

For both luminance and chrominance signals, the circuit constant for main emphasis is T=1.337 us, X=2.489, and nonlinear emphasis is 8 dB max. The nonlinear and main emphasis characteristics are

1-4-3. Time axis compressing and expansion process

For a system in which the time axis used for color difference signals is compressed during recording and is expanded during playback, a highly accurate time base corrector (TBC) is required because the residual jitter increases during expansion. In M II Format, a pilot burst signal for jitter correction is superimposed and recorded during the period of horizontal blanking, and a stable writing clock for the TBC is reproduced in the play-back process by the use of horizontal synchronizing and pilot burst signals superimposed and recorded, thereby reducing the residual jitter.

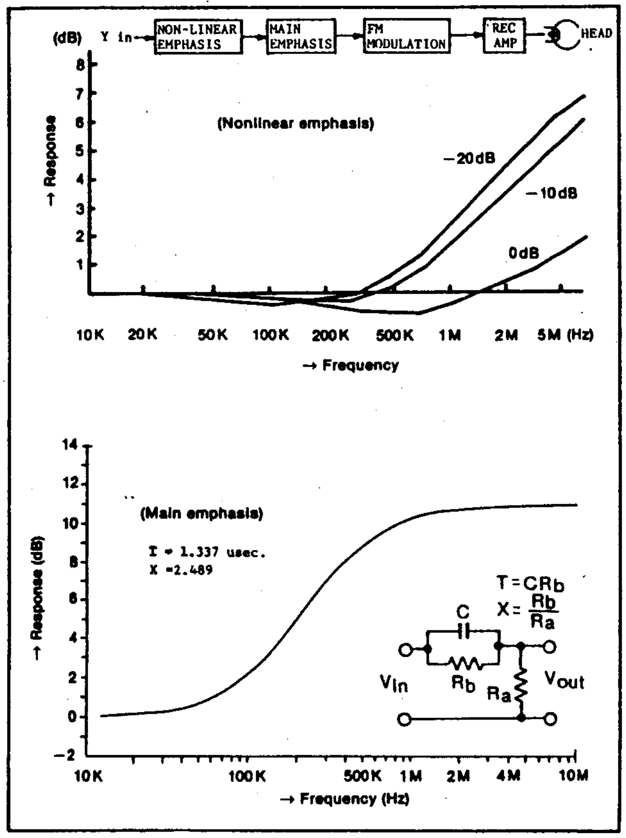


Fig. 1-4 Nonlinear and Main Emphasis Characteristic

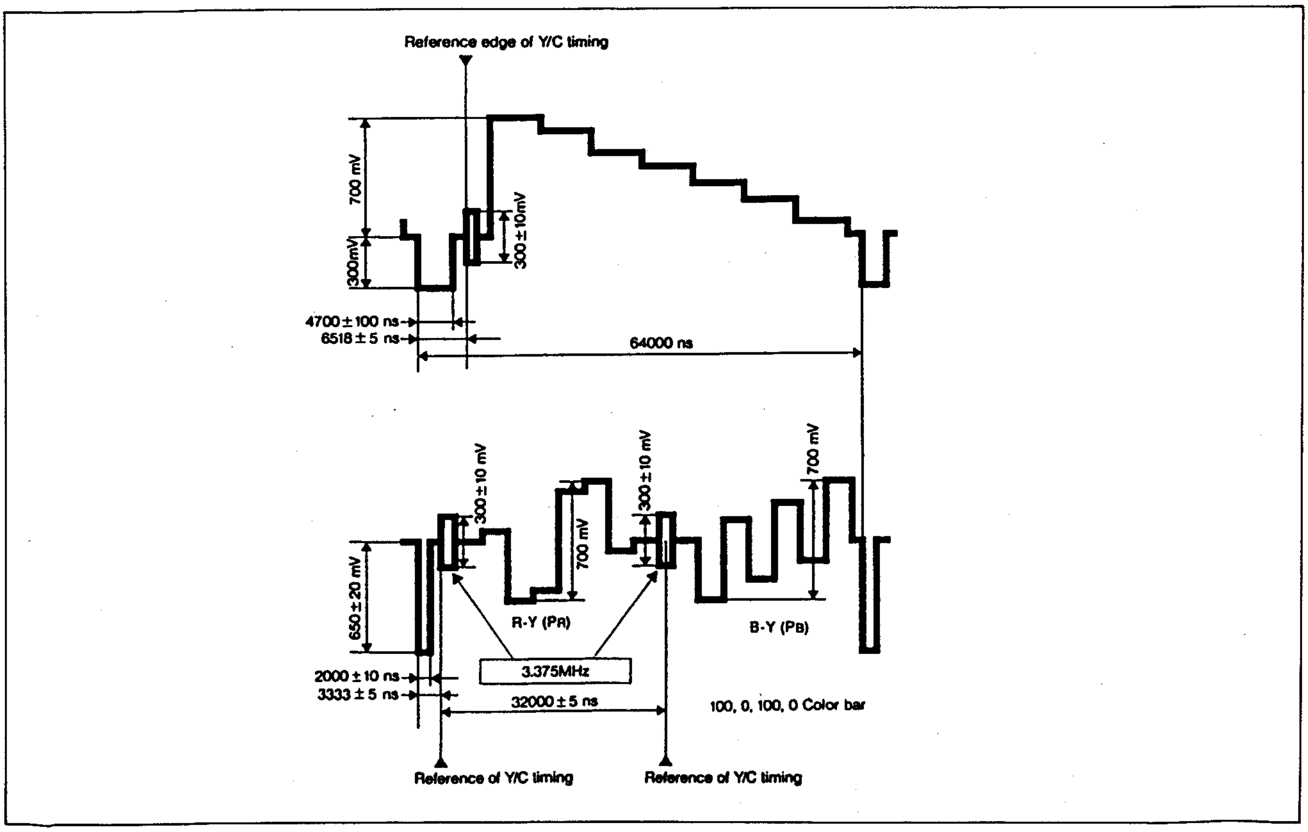


Fig. 1-5 Waveform of Recording Signal

The Y signal is recorded with a pilot burst signal (3.375MHz) synchronized to the horizontal sync signal and added to its horizontal blanking (back porch). A horizontal sync signal and pilot burst signal (1.6875MHz) are added to the horizontal blanking of the Pb signal. Both signals are separately compressed in time axis and are recorded as a time division multiplex signal.

Time base errors in the playback signal can be removed by using the horizontal synchronizing and pilot burst signals for Y/C timing, solving the problem of timing errors which has been the weak link in the time axis compression recording system. The recording signal waveform of M II Format is shown in figure 1–5.

1–4–4. Time Base Corrector (TBC)

Figure 1–6 is the block diagram of the TBC. The TBC consists of A/D, memory, W–PLL, D/A, encoder and SYNC GEN circuits. The TBC has a +– 16H window and is able to output noiseless slow motion (auto tracking playback) by using piezoelectric ceramic actuators at speeds of x(–1) to x(+2). Also, it is able to output colour search pictures at speeds up to x(4) and monochrome search pictures at speeds up to x(32).

In addition, when the VISC signal is added to the video signal, the phase of the TBC read clock is controlled to match the encoder's sub carrier to the VISC signal.

In the A/D block, Y and CTCM signals are changed to PCM signals (Y 8–bit, C 8–bit) and are supplied to the memory block.

The memory block performs video signal processing such as timing adjustments, jitter correction, drop–out correction.

Regarding chrominance signals in particular, level differences are often generated line by line due to clamping errors in time axis compression or level alteration during recording. This may cause line crawling, subcarrier leak or vertical stripe beats in the pictures reproduced. To prevent these problems, it is necessary to perform line averaging of playback Pr and Pb signals. At the same time, field reproduction takes place during auto tracking playback, and line interpolation is performed. Line averaging can be user selected.

In the D/A–ENCODER block, the time axis corrected and expanded PCM signal converted to analogue. The colour difference signal is subjected to balanced modulation. The Y signal, modulated colour signal, and synchronizing signal are added, and this signal is output as a composite video signal.

The W–PLL block performance determines the accuracy concerning residual jitter, vertical sync, and Y/C timing delays between Y, Pb, Pr. The write clock is generated in one of two ways depending on the presence or absence of azimuth skew error. Without azimuth skew, the write clock is synchronized with playback Y. Y and C are timed to each other via APC and AFC loops to a master clock and added H and 3.375MHz burst signals. For the C signal, a burst is added to the Pb and Pr components before time compression for accurate reconstruction during playback.

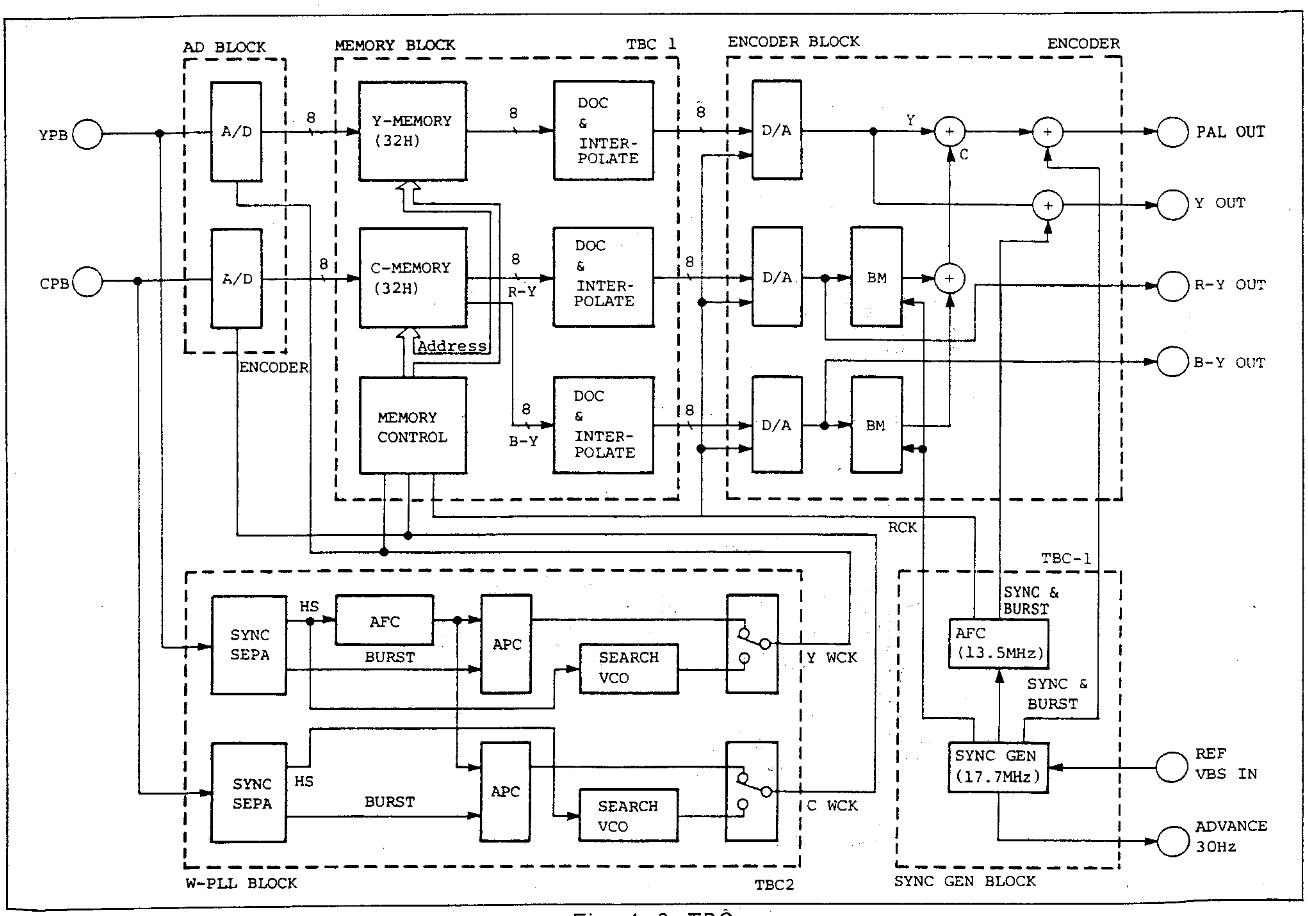


Fig. 1–6 TBC

When azimuth skew exists, the write clock is re-generated by the search VCO and instantaneously phase-locked with each horizontal synchronizing pulse of the Y and C signals.

In addition, this block performs vertical synchronizing and interpolation during auto tracking playback.

In the SYNC GENE block, with an external reference video signal applied, the TBC read clock is synchronized with this reference. Various synchronizing signals, and servo standard 25 Hz signals corresponding to the changeover of R/P and PLAY heads and of REC/PLAYBACK modes are produced.

1-5. Editing System

The M II Format VTR (AU-650B) has been developed as a broadcast VTR with various editing functions, such as video/audio signal insert editing, assemble editing, audio split editing, preview, and review.

Au-630 is a Player VTR and it can do normal play, JOG, search, variable speed play, variable memory, cue up, TSO, program play function.

Automatic editing can also be performed by an editing system consisting of a player, a recorder and an editing controller (AU-A60). The control unit is furnished with 9-pin serial interface (RS-422 standard) and 50-pin parallel interface connectors. It is provided with modes ranging from x32 high speed search (shuttle mode) to noiseless slow and jog mode so that highly accurate search can be performed. It is equipped with a SMPTE time code generator/ reader and external time code generator reader connectors. The same, AU-650B has a capstan over-ride function and is able to perform +- 0 frame editing when using time code. It has an auto-H-phase circuit to maintain the continuity of horizontal sync at the editing point.

1-6. Conclusion

The target specifications have been achieved by using the above-mentioned recording system and metal particle tape. Also, we have achieved the purpose with respect to dubbing characteristics important for broadcast.

As for the mechanism, we have developed a new transport system capable of stable tape travel using thin metal particle tape at speeds of 0 (still) to x(+-32). We have conducted strength analysis by the finite element method in the stages of design to ensure high reliability.

1-7. GENERAL DESCRIPTION OF AU-630

1-7-1. Comparison between AU-650B and AU-630

Au-630 is the playback VTR which is made based on the studio editing VTR AU-650B, so it is beneficial to be compared with AU-650B.

The comparison table is shown below.

NO.	Item	AU-650B	AU-630
1.	Drum Unit	R/P,AT,Rotary Erase heads	AT and Dummy heads
2.	Audio Erase Erase	Used	Not mounted
3.	Audio Rec/ PB heads	Used	Playback only
4.	Audio Monitor heads	Used	Not mounted
5.	Full-Erase head	Used	Exist, but not used
6.	L1 board (Sync Gene/ TBC1)	------- same board	--------
7.	L2 board (TBC2)	------- same board	--------
8.	L3 board (Encoder)	------- same board	--------
9.	L4 board (TCM REC/ FM Audio)	Used	Not used FM Audio is moved to S5.
10.	L5 board (Servo)	Used	Rec and Editing circuits are not used.
11.	L6 board (Syscon/ TC)	Used	Rec and Editing circuits are not used.
12.	S1 board (Decoder 1)	Used	Not mounted.
13.	S2 board (Decoder 2)	Used	Not mounted.
14.	S3 board (C PB)	------- same board	--------
15.	S4 board (Y PB)	------- same board	--------
16.	S5 board (RF Processing/FM Audio)	RF Processing FM Audio is located on L4.	RF Processing and FM Audio.
17.	S6 board (Audio 1)	Used	Playback only.
18.	S7 board (Audio 2)	Used	Not mounted.
19.	S8 board (Audio 3)	Used	Not mounted.
20.	S9 board (AT)	Used	Used. Only ROM is different.
21.	S10 board (Power & Drive)	------- same board	--------
22.	L0 board (L Mother)	Used	Used, Different.
23.	S0 board (S Mother)	Used	Used, Different.
24.	Audio Main board	Audio In/Out	Audio Out.
25.	Hour Meter	Digital Meter	Analogue Meter. Digital meter will be supplied as option.
26.	Front Sub-	Used..	Removed the following. 1. Rec current control. 2. Rec Inhibit switch. 3. Time Code set switch. 4. RP head equalizer.
27.	R/P Head Amp	Used.	Used for AT head.
28.	AT Head Amp	Used.	Not mounted.
29.	Power unit	Used.	Used. A fuse is added. Fun motor stop detection circuit is added.
30.	Front Pull-out Drawer	Used.	Used. Removed the following. 1. Input select switch. 2. Mode select switch. 3. Head select switch. 4. WFM input switch.
31.	Front Panel unit	Used.	Used. Removed the following. 1. Tracking VR 2. Video VR 3. Audio Rec VR 4. Rec switch 5. Edit switches 6. TC set switch 7. Input SCH LED 8. Limiter LED Added the following. 1. Cue switches 2. Preset slow switches 3. Variable Memory switches
32.	Front Panel boards	Front Panel A,B,C	Front Panel A,B Different
33.	Rear Panel	Used.	The following connectors are removed. 1. Audio Input 2. TC Input 3. Video Line Input 4. Component 1 Input

1-7-2. Video Heads

The video heads assignment is shown below.
AU-630 is the playback VTR, so only AT heads are used and dummy heads are mounted instead of other heads.

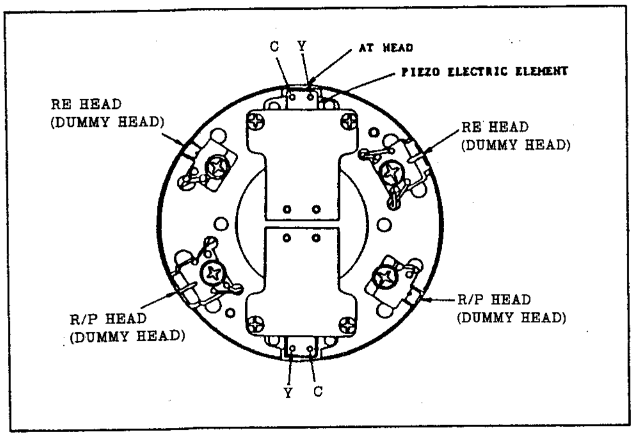


Fig. 1-6. Video Heads

The AT heads are driven by the AT circuit (S9 Board) through the connector P1 on AT board (S9) and connector P450 on the drum motor.
The AT heads pick up the recorded video signal and the picked up Y signal goes to AT head amp through connector P421 and C signal goes to AT head amp through connector P422.
The RF video signal is amplified by the AT head amp, and the amplified RF video signal goes to the RF PROCESSING and FM AUDIO circuit (S5) from connector P423 (Y) and connector P424 (C) through connector P60 on S Mother board (S0).

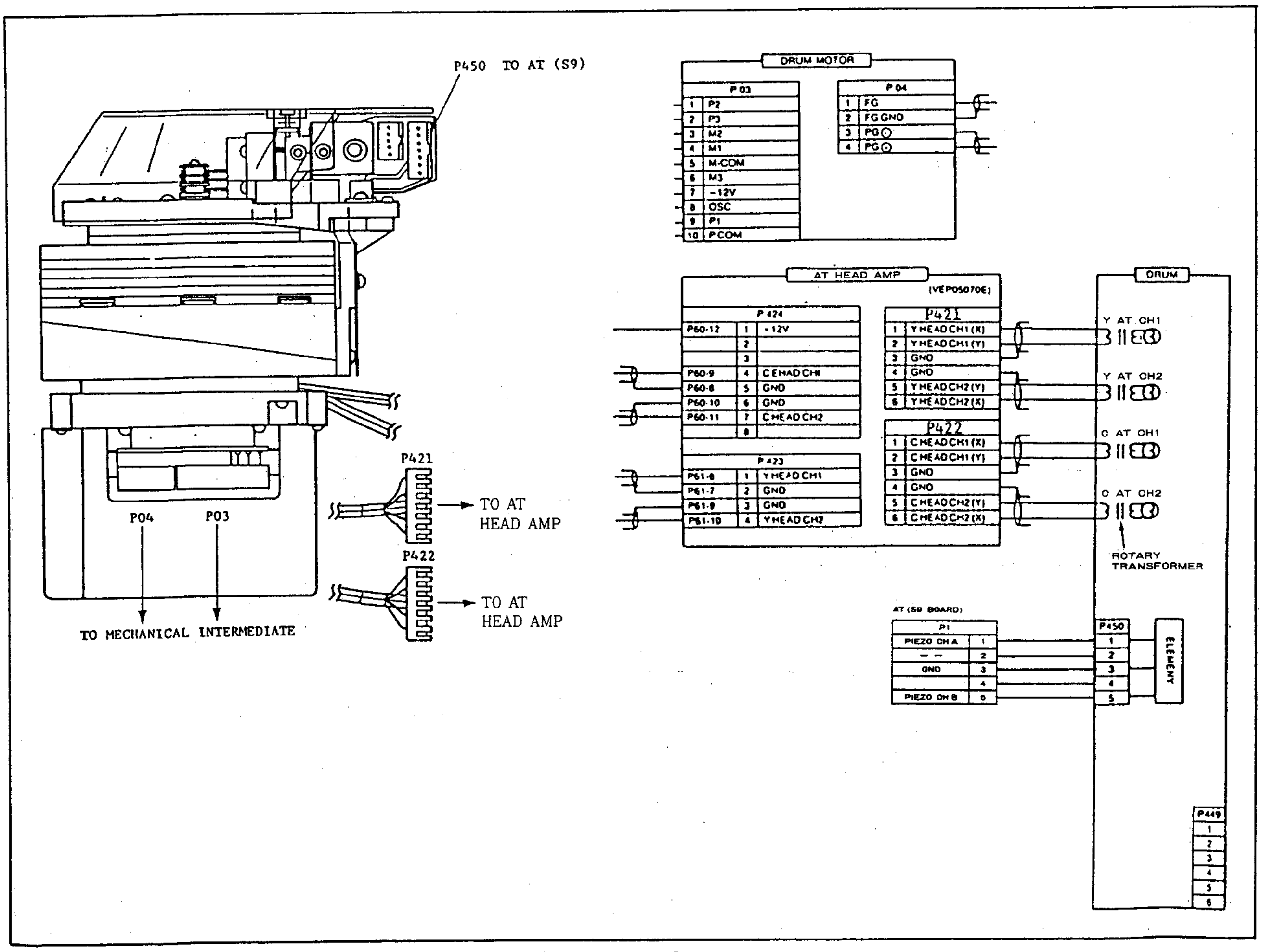


Fig. 1-7. Drum Connectors

1-7-3. video Signal process

The recorded Y and C signal is picked up by the rotary video heads Y CH1, Y CH2, C CH1 and C CH2.
The signal is supplied to the Head Amp circuit which is located at bottom of the VTR. The Head Amp circuit amplifies the video RF signal.
The output signal from the Head Amp circuit is supplied to "PB AMP and FM AUDIO (S5)" circuit.
The signal from the Head Amp circuit is amplified and CH1 and CH2 signal are switched and mixed by Head switching circuit and continuous RF signal is obtained.
On the other hand C signal includes the FM Audio signal and it is separated by the B.P.F. (400KHz for CH3 and 700KHz for CH4) and they are demodulated by this circuit.
Y RF signal is supplied to Tracking meter and Y PB circuit (S4). The RF signal is supplied to the Frequency equalizer and then it is demodulated by the demodulated circuit.
Y RF signal and Y DEMOD signal are observed by using WFM (Waveform Monitor) output.
The Y DEMOD signal has pilot burst.
C RF signal is supplied to C PB circuit (S3).
The C RF signal is supplied to the frequency equalizer and demodulator.
C RF signal and C DEMOD signal are observed by using WFM output.
The C DEMOD signal is a CTCM signal with pilot burst and H sync.
Drop Out pulse is detected by RF signal from Y RF and C RF.
The demodulated Y and C signals are supplied A/D converters on Encoder board (L3).
When the signal is converted to digital signal sync is not be converted to expand the video dynamic range.
The digitalized Y and C signals are supplied to TBC1 circuit (L1).
The TBC stabilizes the Y and C signal and C signal is separated to Pb (B-Y) and Pr (R-Y) signal, the the signal is supplied to Drop Out Compensation circuit (D.O.C.).
TBC write clock and drop out pulse are supplied from TBC2 (L2) circuit and TBC read clock is supplied from Sync Generator (L1) circuit.
The output signal from TBC circuit is supplied to Encoder (L3) circuit again.
The digitalized Y, Pb (B-Y) and Pr (R-Y) signals are converted to analogue signal by D/A converters.
Y sync is supplied from the Sync Generator (L1) circuit. The Y and Chrominance are mixed and composite video signal is observed by WFM output.
The Sync Generator (L1) circuit is synchronized with REF VIDEO signal, and it generates black burst signal which is locked with REF VIDEO.

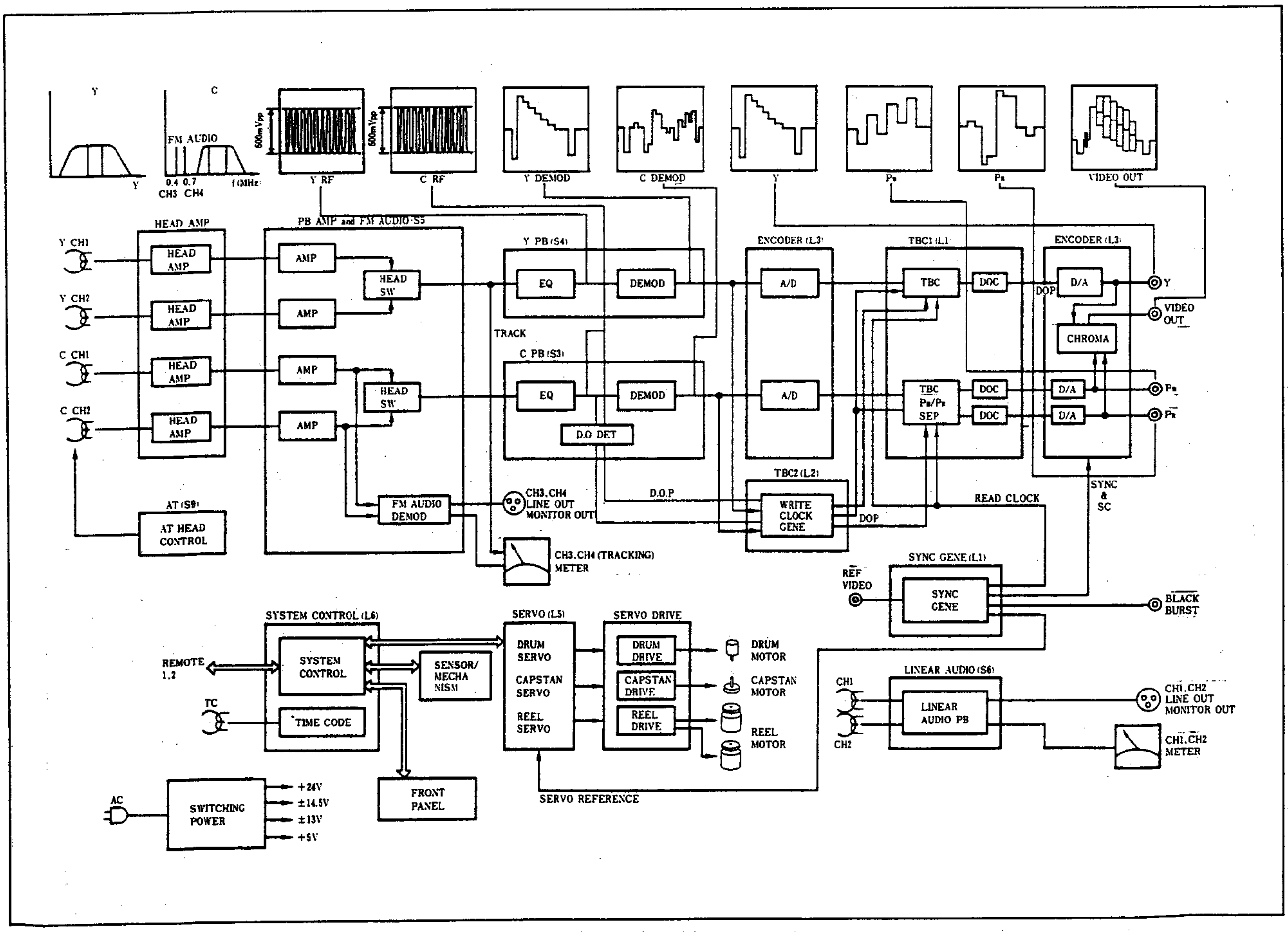


Fig. 1-8. Overall Block Diagram

1-7-4. Front Panel

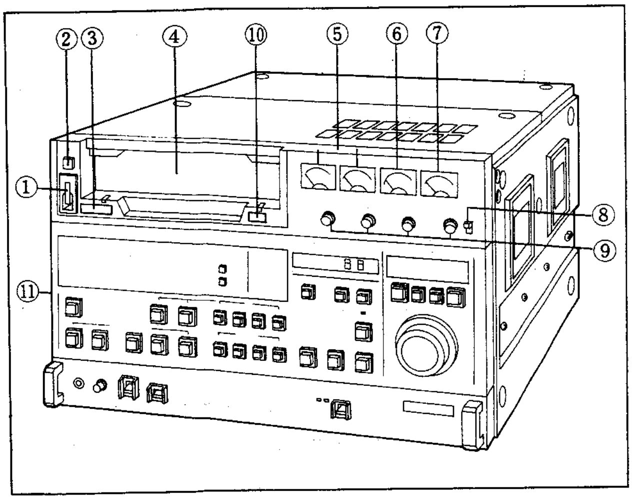


Fig. 1-9. Front Panel

(1) Power Switch
Main Power is turned ON or OFF.

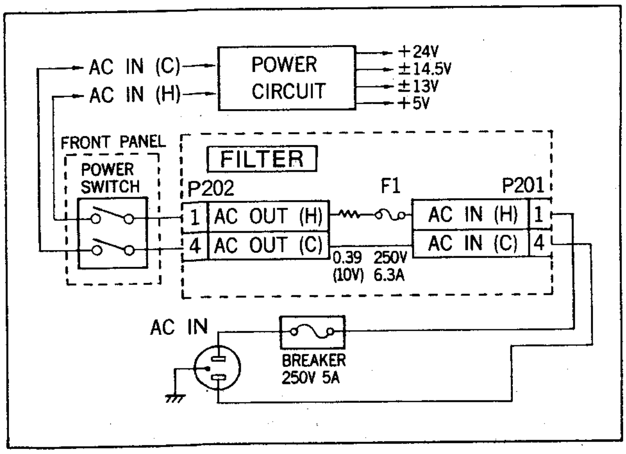


Fig. 1-10. Power Switch

(2) Eject Button
Pressing this button will eject the tape. The lamp goes out during the ejection process and remains until after the tape is ejected.

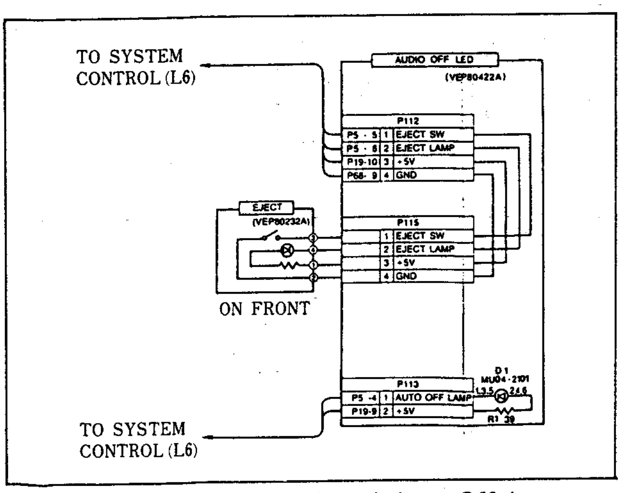


Fig. 1-11. Eject Switch and Auto Off Lamp

(3) Auto Off Lamp
This lamp lights up when the following conditions are prevalent.

[1] SENSOR LED --- "E-16" is displayed.
When the tape begin and end detect sensor LED is damaged.

[2] FRONT LOAD MOTOR --- "E-14" is displayed.
Cassette does not move up within 5 sec. after shifting to the EJECT mode.

[3] LOADING MOTOR --- "E-15" is displayed.
Tape unloading is not completed within 10 sec.

[4] DRUM MOTOR --- "E-10" is displayed.
Drum rotation does not begin within 5 sec.

[5] REEL MOTOR --- "E-11" is displayed.
Take-up reel (FWD) or Supply reel (REV) does not rotate while a maximum of 10 cm of tape is advanced.

[6] S REEL OVER HEAT --- "E-12" is displayed.
Supply reel motor temperature is over the range of 90 ~ 100 C degrees (194 ~ 212 F degrees).

[7] T REEL OVER HEAT --- "E-13" is displayed.
Take-up reel motor temperature is over the range of 90 ~ 100 C degrees (194 ~212 F degrees).

[8] TAPE SLACK --- "E-18" is displayed.
Tape slack or improper winding is occurred.

[9] DEW --- "E-17" is displayed.
Moisture is present in the machine.

[10] REEL DRIVE ERROR --- "E-19" is displayed.
The actual tape operation is different from the selected mode, during high speed travel of the tape (+-8x, +-32x, FF, REW).

[11] DC POWER TROUBLE
If +12V voltage of S circuit (S0 --- S10) has lowered. --- "E-1A" is displayed.
If the appropriate voltage has lowered.
DC +12V --- "E-1B" is displayed.
DC +24V --- "E-1C" is displayed.
DC -5V --- "E-1d" is displayed.
DC -12V --- "E-1E" is displayed.

(4) Cassette Holder
This is where cassette tape is inserted.
Both standard and small cassettes can be used.
Large or small cassette is detected by the Large cassette detection switch.

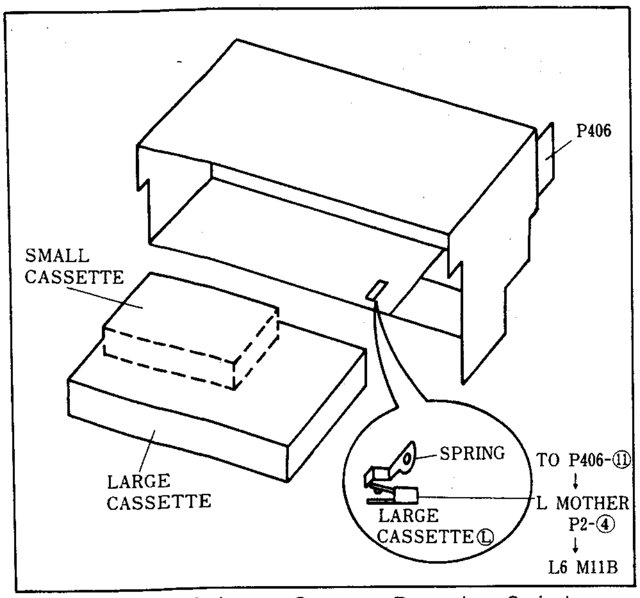


Fig. 1−12 Large Cassette Detection Switch

(5) Linear Audio Level Meter CH1, CH2
This is the level meter for linear audio.

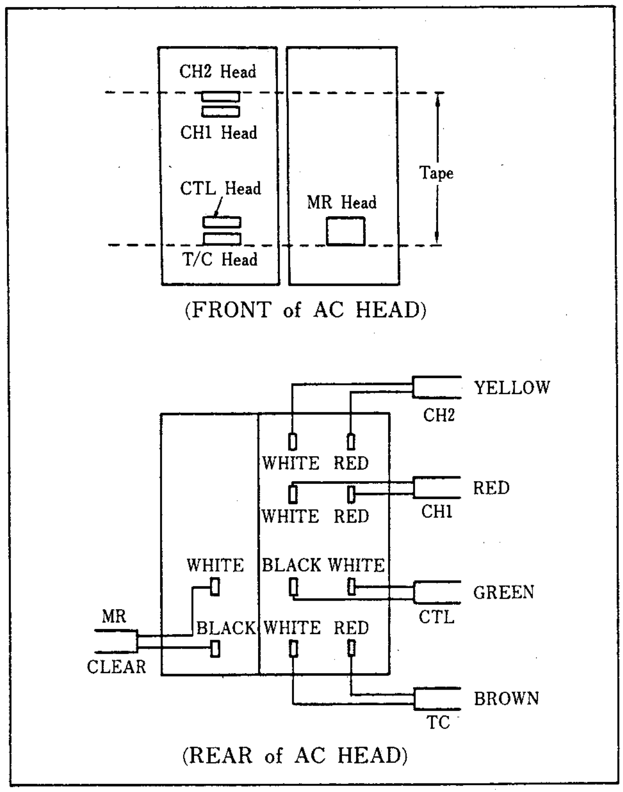


Fig. 1−13. Audio Control Head

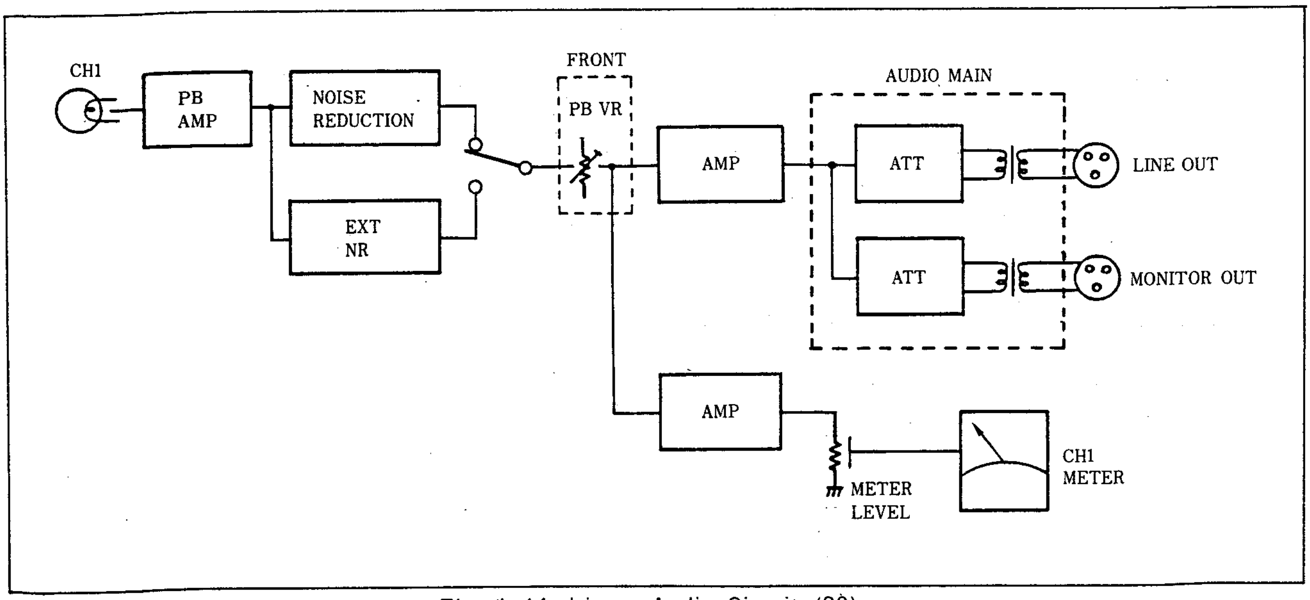


Fig. 1−14. Linear Audio Circuit (S6),
PB VR and Meter

(6) FM Audio Level Meter CH3
This is the level meter for FM Audio.

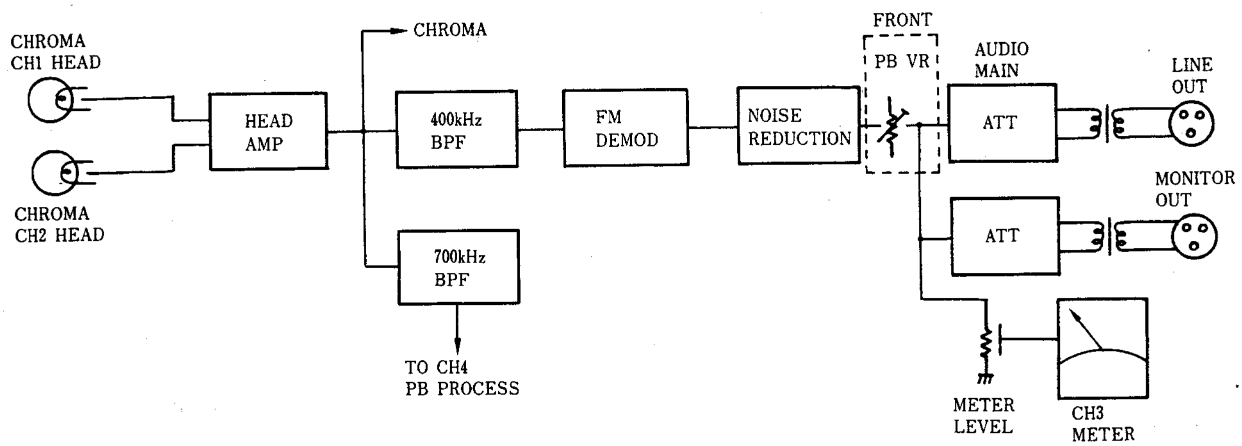


Fig. 1–15. FM Audio Circuit (S5),
PB VR and Meter

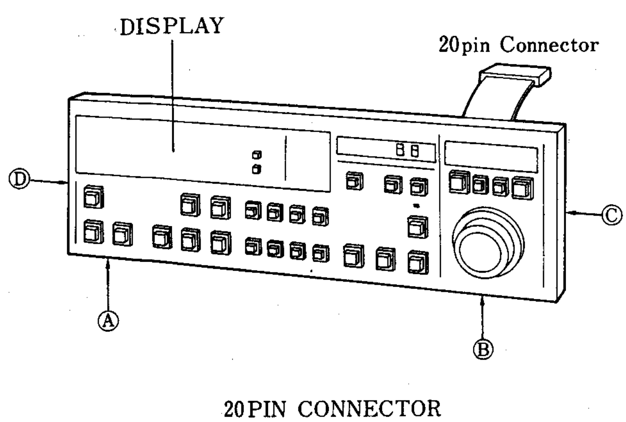
(7) FM Audio Level Meter CH4/Tracking Meter
This can be selected FM Audio level meter CH4 or Tracking meter by the select switch on the Front Panel.
Tracking control is not used because of the action of the Auto Tracking System.

(8) Tracking/ CH4 Switch
Tracking: Used to monitor the tracking or RF level.
CH4: Used to adjust the level of FM Audio CH4.

(9) Audio Playback Level Adjust Control
Pulled out: Manual Set
Pushed in: Preset Level
Pull out in PB mode to set the required level. With these control depressed, playback can be done at the optimum audio level.

(10) PCM Lamp
This lamp lights up during playback PCM.
In this case linear Audio is erased by PCM Audio.

(11) Front Panel



P150

No.	NAME	I/O
1	SERIAL IN	IN
2	GND	- -
3	SERIAL OUT	OUT
4	D. STILL	OUT
5	S00	OUT
6	S01	OUT
7	CLUTCH	IN
8	+24V IN	IN
9	OPEN	- -
10	+5V IN	IN
11	+5V IN	IN
12	+5V IN	IN
13	+5V IN	IN
14	+5V IN	IN
15	+5V IN	IN
16	GND	- -
17	GND	- -
18	GND	- -
19	GND	- -
20	GND	- -

Fig. 1–16. Front Panel

[1] Display
This display shows time code or tape remaining they are selectable by dip switch on the Front Panel B circuit.
This is a fluorescent information panel (FIP). This FIP is driven by −22V voltage from DC−DC converter, and the information is controlled by CPU (IC4) and IO (IC13) on the Front Panel B circuit.

[2] Key Board
The key operation is detected by using the key matrix circuit on the Front Panel A circuit, and the key matrix is scanned by IO IC13 and detected by CPU IC4.
The detected key information is sent to the system control circuit by using serial data from SIO IC11.

[3] Search Dial
Search Dial is used for SEARCH, JOG and VAR functions.
In the JOG mode there is no end position but in the SEARCH or VAR mode end point is fixed.
This function is performed by end terminal and clutch in the search dial unit. This clutch is controlled by clutch low signal from system control circuit (L6). This clutch is driven by +24V voltage.
To detect the search dial rotation the wheel stripe and 2 photo sensors are used. The 2 photo sensors are mounted 90 degree different and S0 and S1 signals are generated.

[4] Front Panel A and B circuit
Front Panel is composed of Front Panel A and B circuit.
The main part of this circuit is CPU IC4. The CPU IC4 controls ROM, RAM, I/O and LED drivers.
The CPU on the Front Panel B communicates with the CPU on the system control circuit with serial data.
Preroll time is set by the rotary switch on the Front Panel B circuit and "NEGATIVE" indication, "TAPE REMAINING" indication and "TSO TIME" is selectable by the dip switch on the Front Panel B circuit.

[5] 20 pin Connector
The 20 pin connector is used to connect the Front Panel and VTR.
The Front Panel can be separated from body of the VTR and used as the Remote Control by using extension cable.
The acceptable length of the extension cable is less than 3 m. When the extension cable is longer than 3 m, +5V is drop and DC−DC converter may not work, so external +5V power supply is necessary. For this purpose Remote Control Panel Case is supplied as an option.

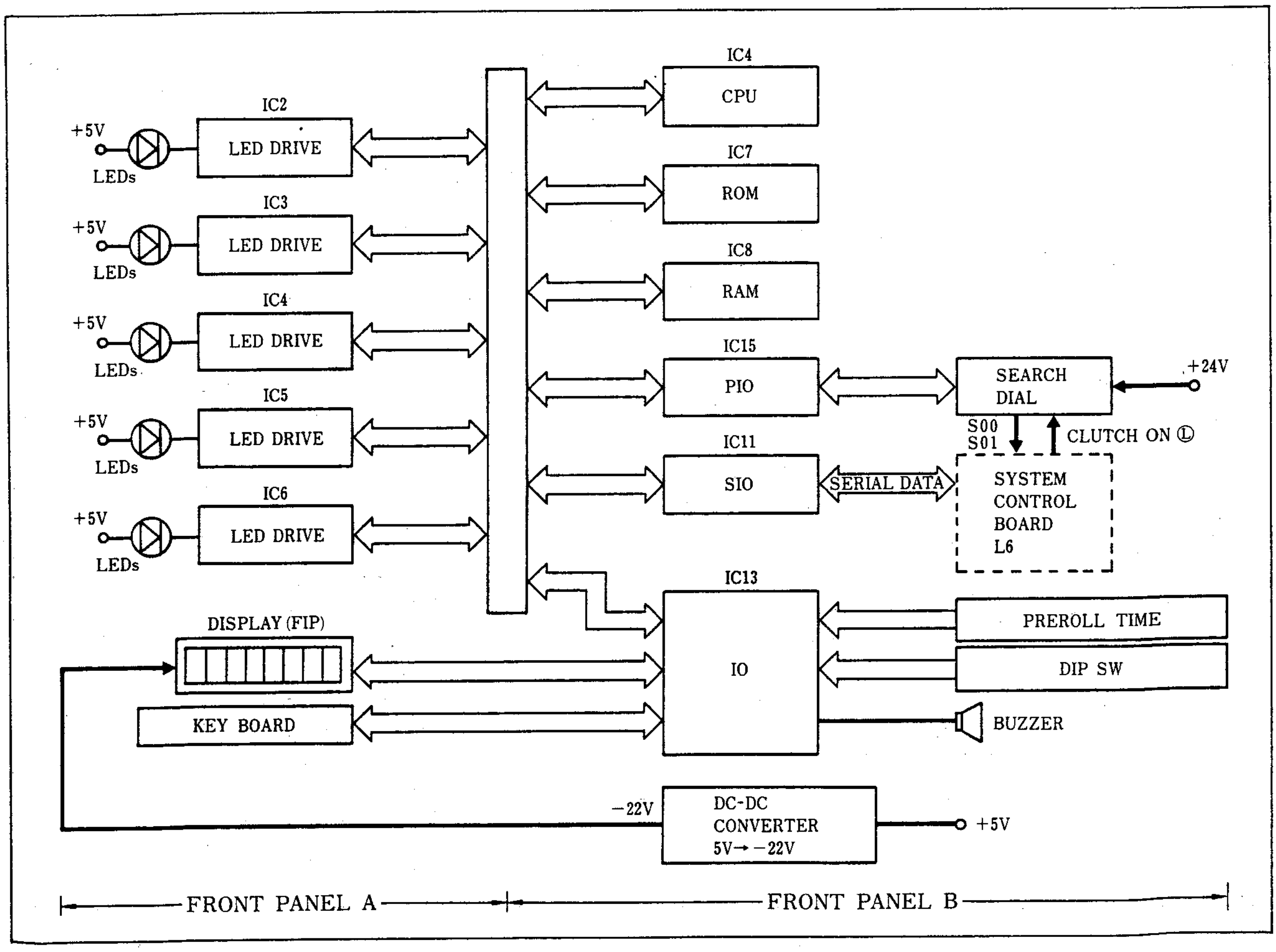
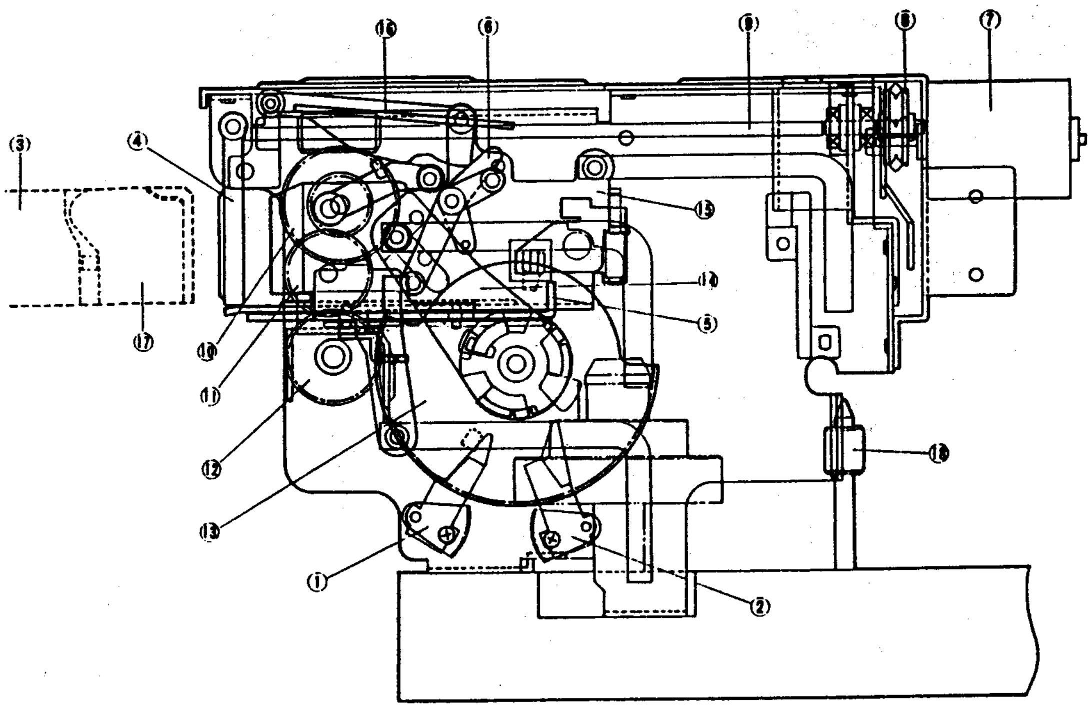


Fig. 1−17. Front Panel Block

2. MECHANISM

2-1. FRONT LOADING OPERATION

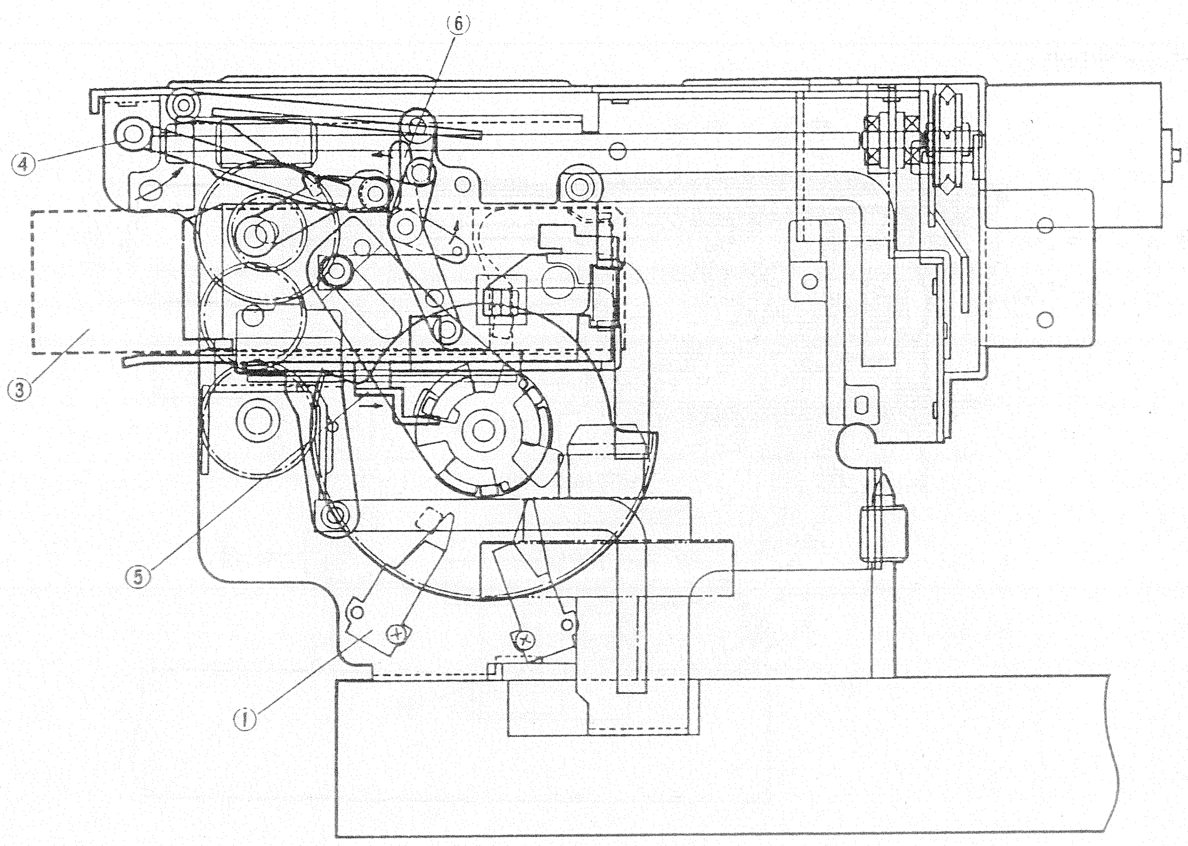
(1) Initial Condition



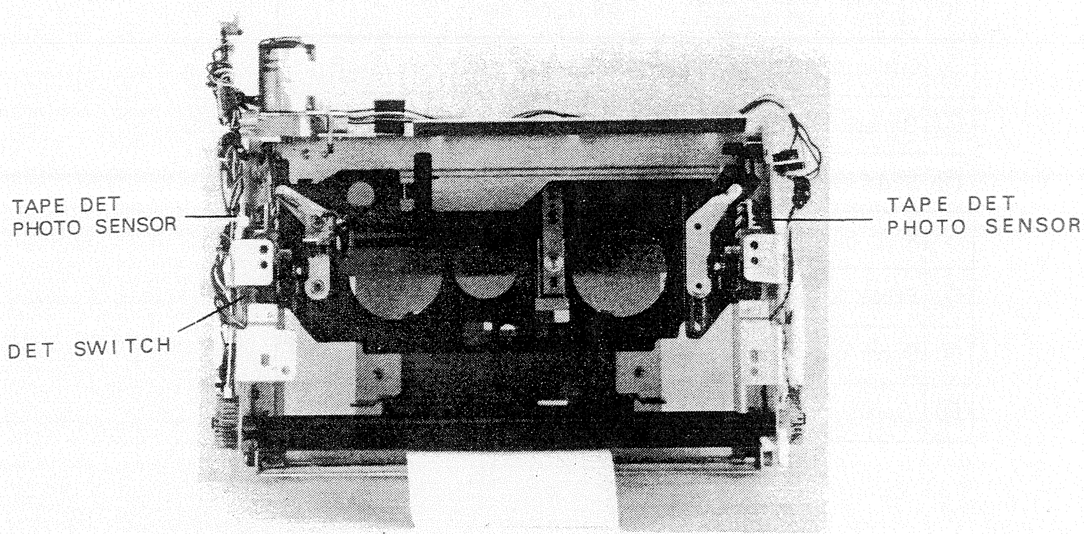
Cassette UP switch, (1) -> ON condition (Leaf switch) Cassette Down switch, (2) -> OFF condition (Leaf switch)

NO.	NAME	NO.	NAME
①	Cassette up finish switch (leaf switch)	⑩	Worm gear
②	Cassette down finish switch (leaf switch)	⑪	Link gear
③	Cassette tape	⑫	Main shaft gear (L.R)
④	Blinder panel	⑬	Wiper gear (L.R)
⑤	Slide lever (R.L)	⑭	Wiper arm (L.R)
⑥	Kick out drive lever	⑮	Cassette holder unit
⑦	Front loading motor	⑯	Cassette mirror
⑧	Drive pulley	⑰	Cassette Cover
⑨	Worm shaft	⑱	Cassette positioning post

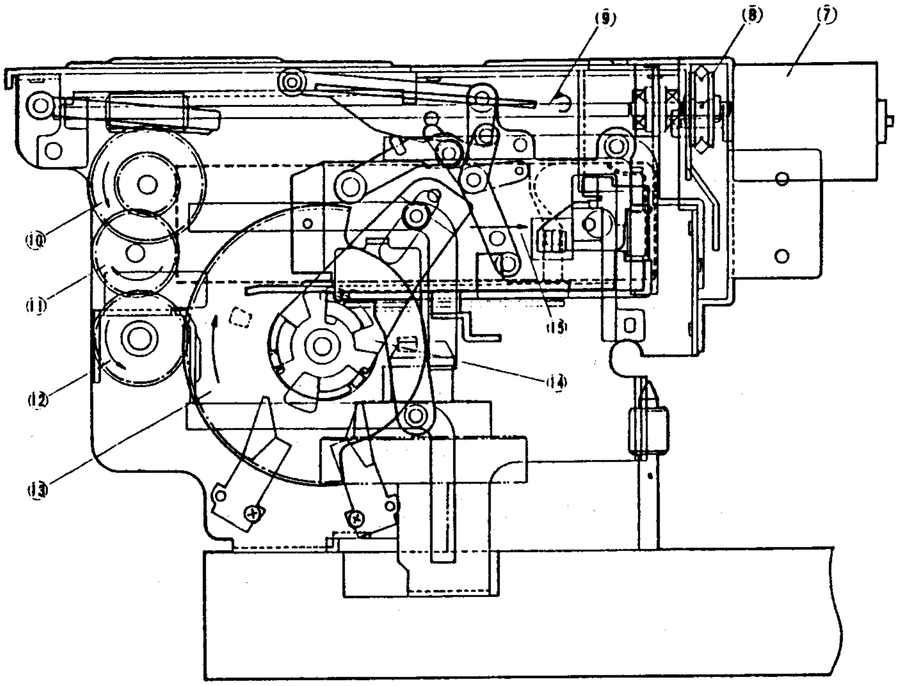
(2) Cassette IN



1. The blinder panel (4) is opened by inserting the tape (3).
2. By inserting the tape, the slide levers (R,L) (5) cause the tape detection photosensor (photo) to detect the tape.
   The kick out drive lever (6) also moves in the direction of the arrow.

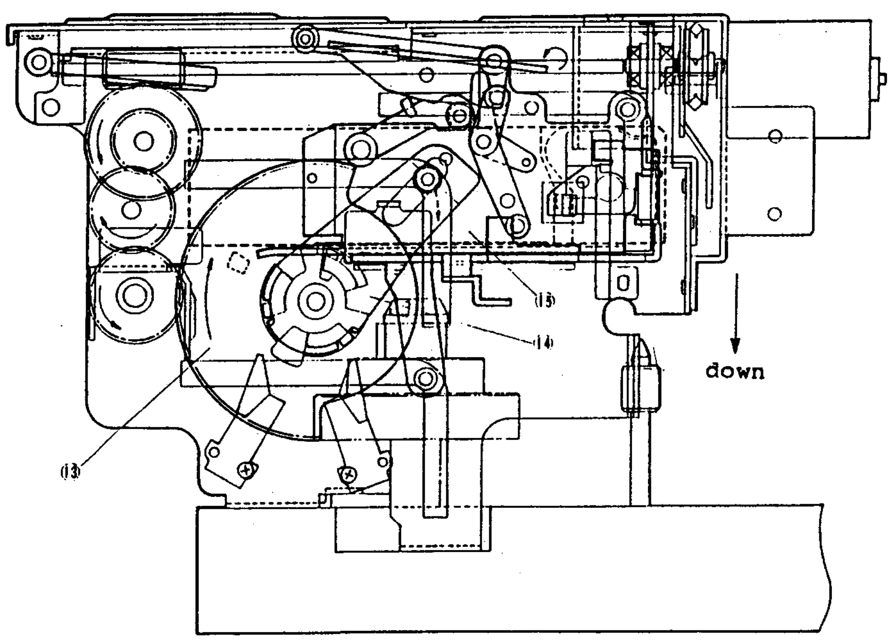


(3) Front Loading Start



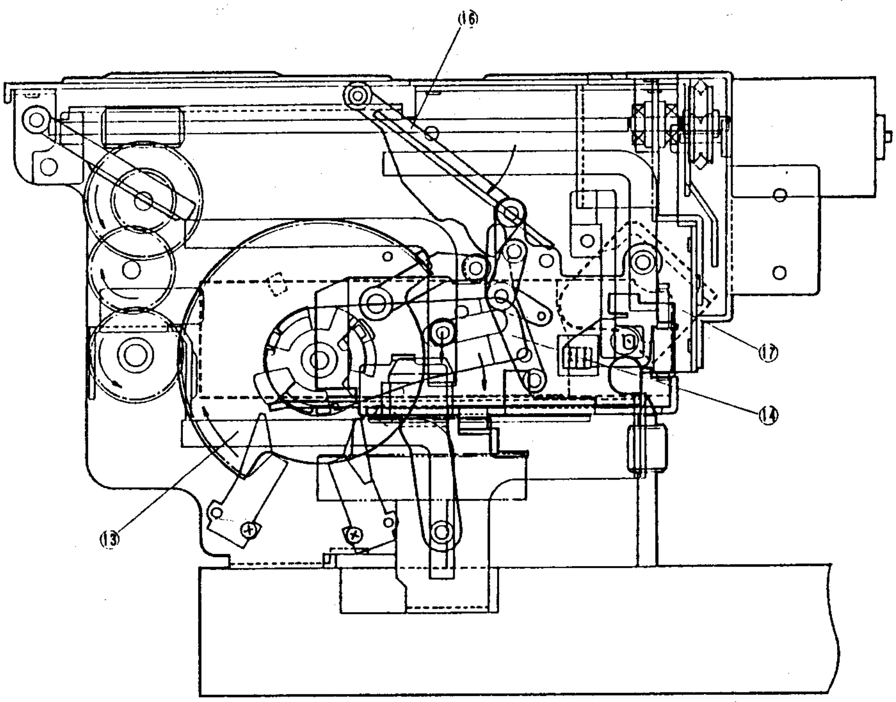
1. The front loading motor (7) starts and turns the worm gear (10) left via the drive pulley (8) and worm shaft (9).
2. The worm gear (10) turns the intermediate gear (11) right, the main shaft gear (12) left and the wiper gear (13) right, which causes the cassette holder (15) to slide right via the wiper arm (14).

(4) Cassette Down start



The wiper gear (13) continues to turn right as in front loading start operation and moves the cassette holder (15) down via the wiper arm (14).

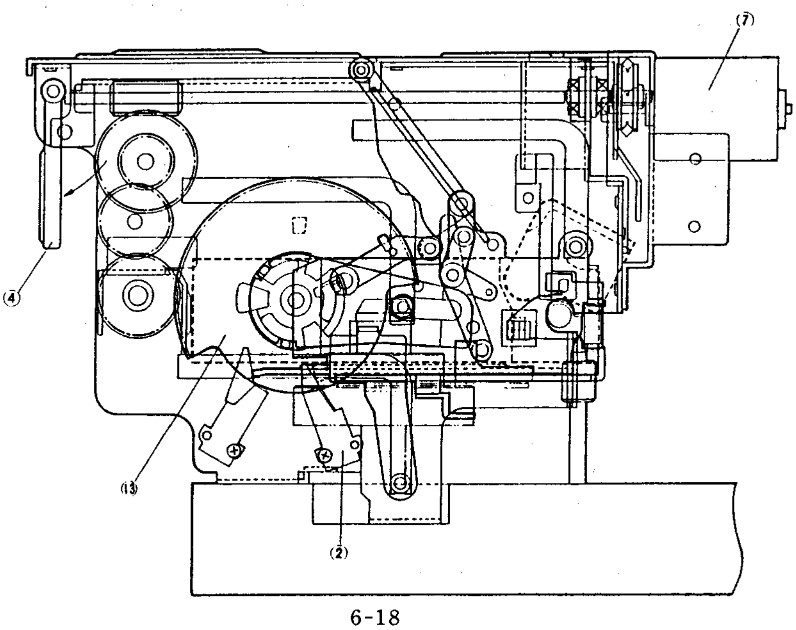
(5) Cassette down – cassette cover OPEN



1. The wiper gear (13) continues to turn right as in the front loading start operation and moves the cassette holder (15) down via the wiper arm (14), at which time the cassette cover (17) opens according to the timing in the diagram above.

2. As the cassette holder moves down, so does the mirror holder (16), thus making it possible to view through the tape insertion window via the mirror.

(6) Front loading completion



1. Front loading finishes when the cassette down switch (leaf switch) (2) is turned on by the projection on the wiper gear (13), thus causing the front loading motor to stop.
2. The blinder panel (4) will also close.

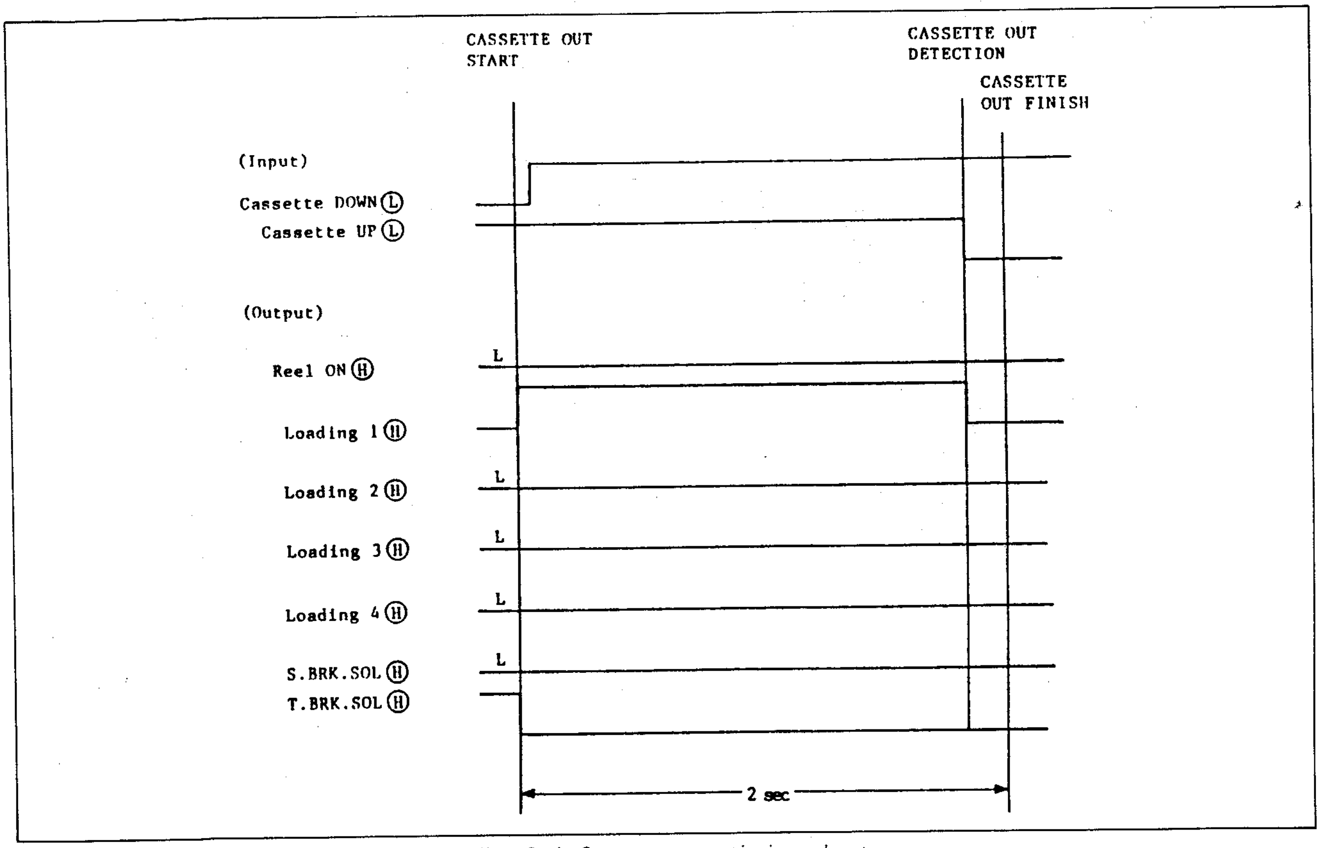


Fig. 2-1 Cassette out timing chart

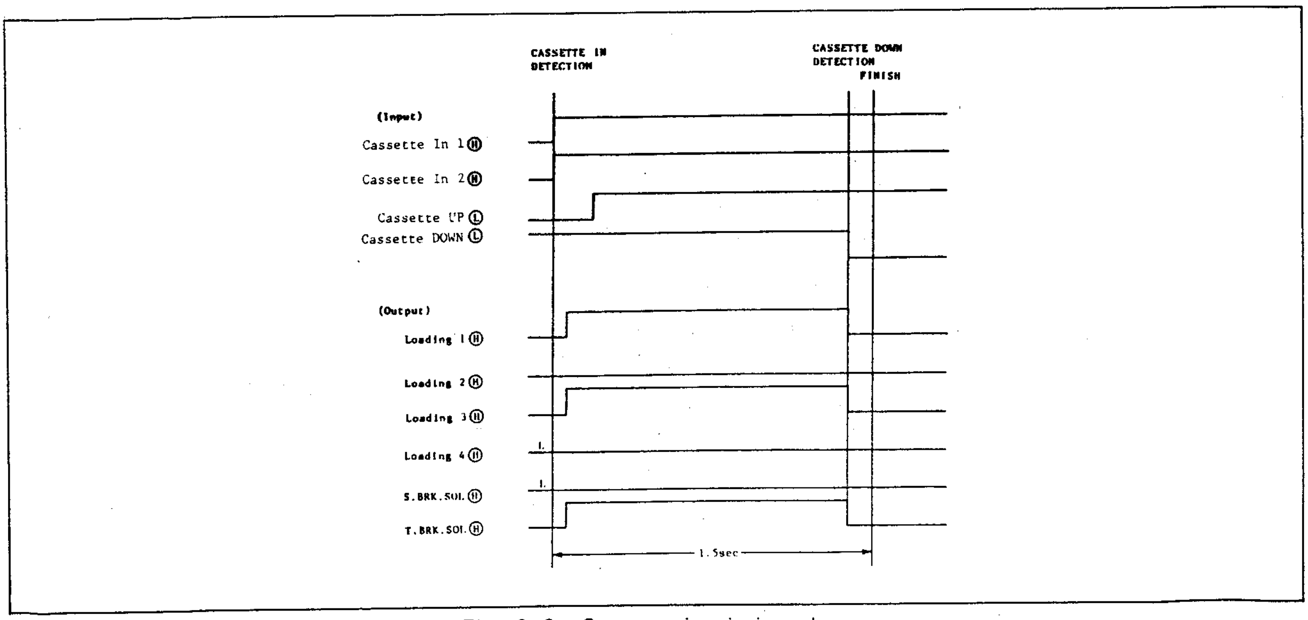
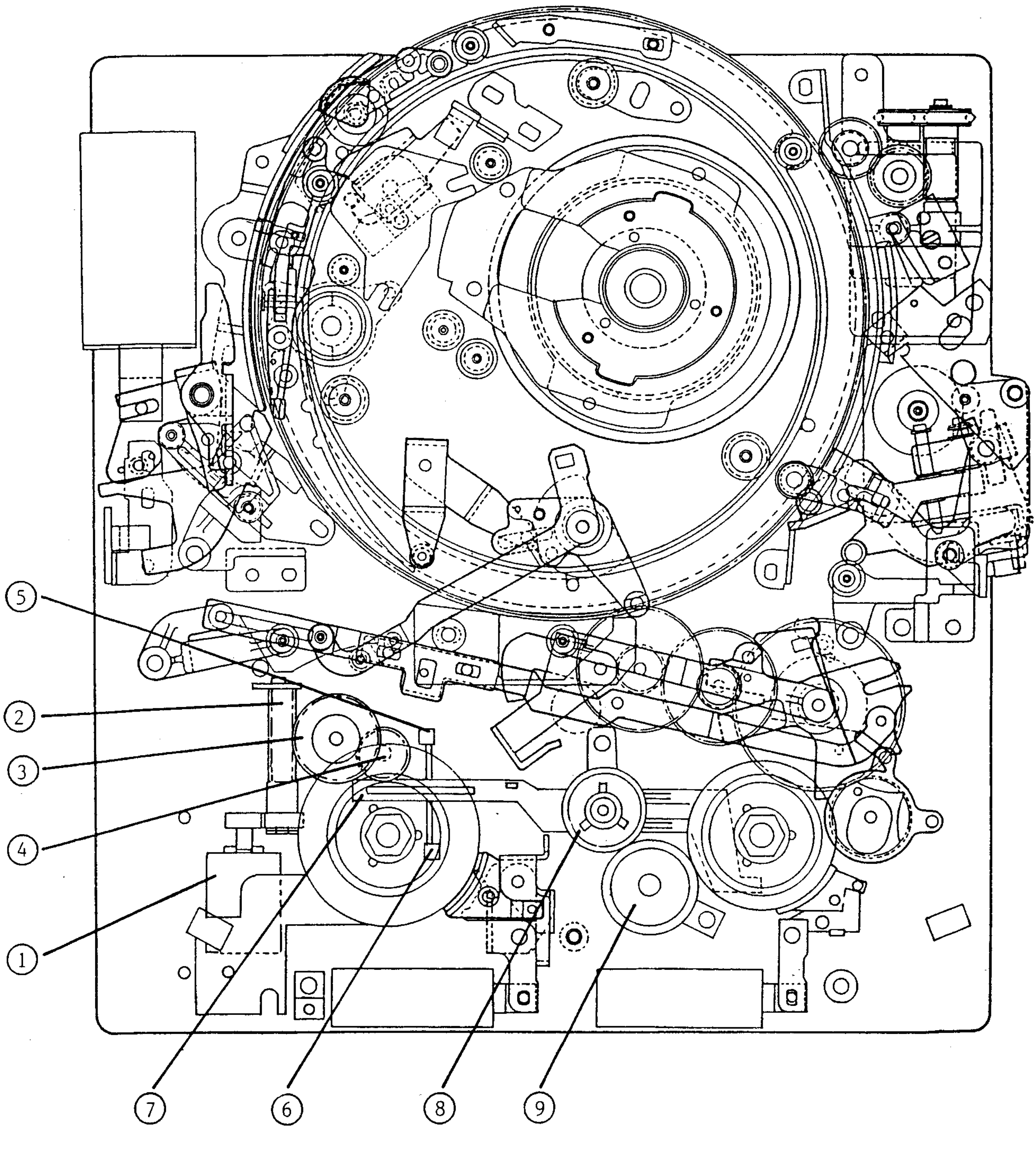


Fig. 2-2 Cassette in timing chart

2-2. REEL BASE OPERATION

The take up reels for large and small cassettes differ, so depending on the cassette used, the take up reel for the small cassette will rise or remain lowered. This operation is performed only when the cassette is inserted, and the condition will be maintained until a different size cassette is inserted. (1) Changing from a small cassette to a large cassette Front loading unit [cassette IN switch on, cassette recognition switch on] -> small reel UP switch (6) on/detection -> small cassette motor (1) on/turns right -> worm gear (2) turns left -> reduction gear (3) turns right -> transfer gear (4) turn right -> slide lever (7) moves left -> [small cassette reel base (8) moves down/intermediate gear (9) separates from reel base] -> small reel DOWN switch (5) on -> motor (1) off.



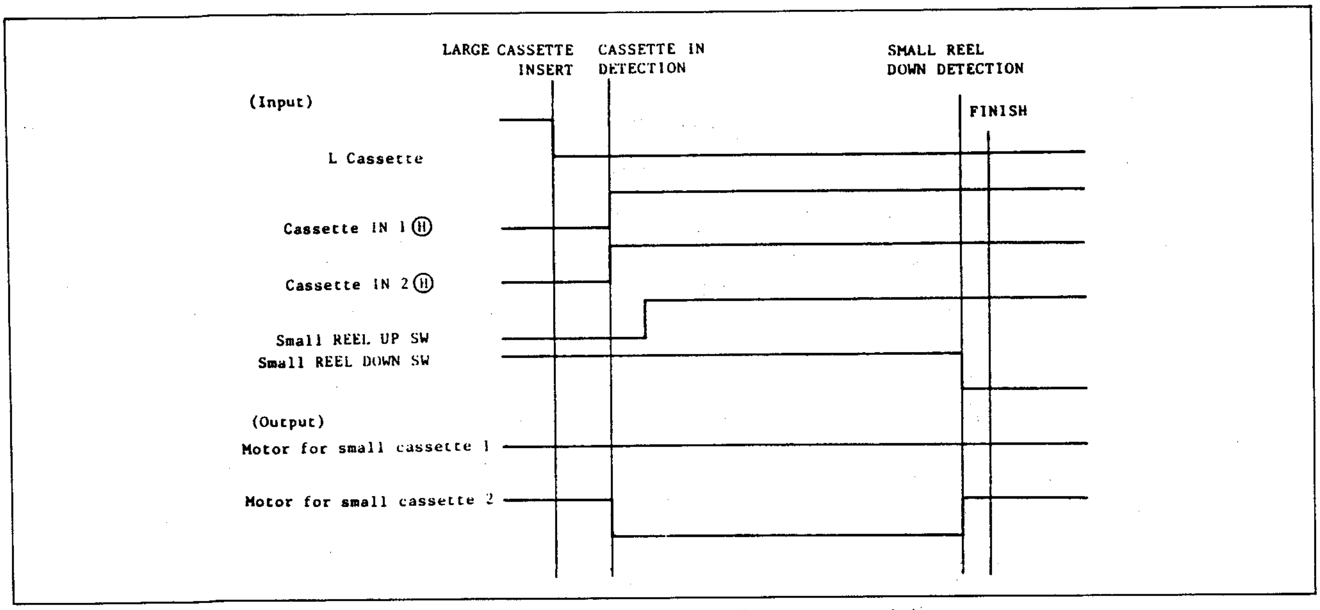
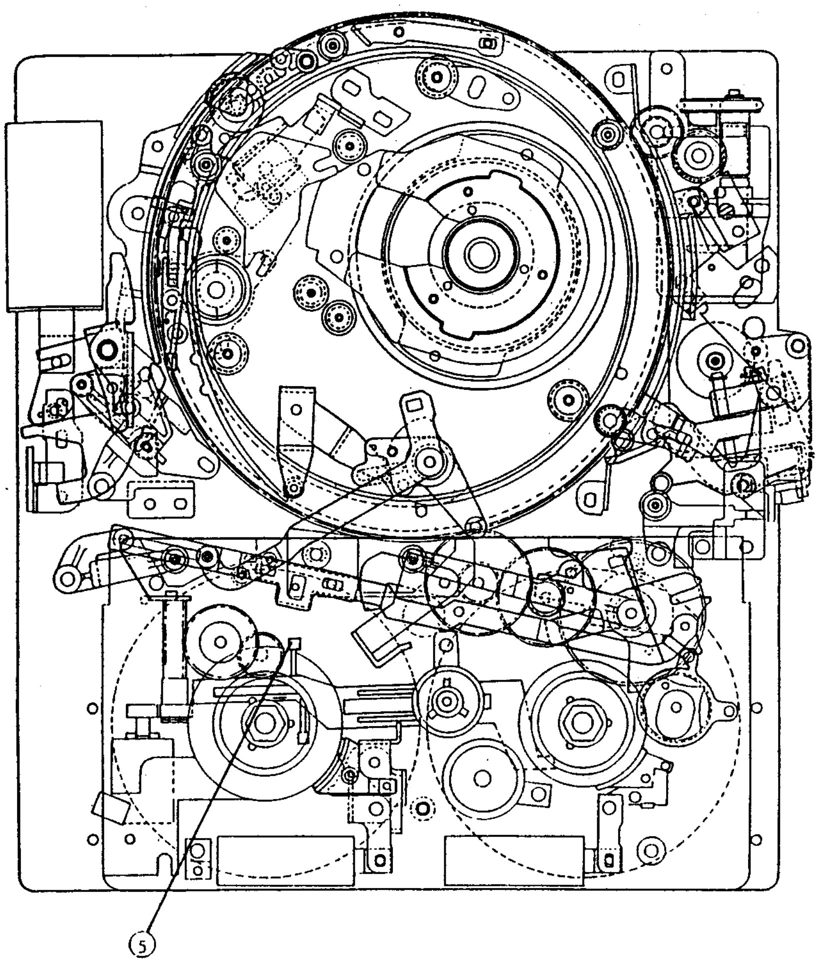


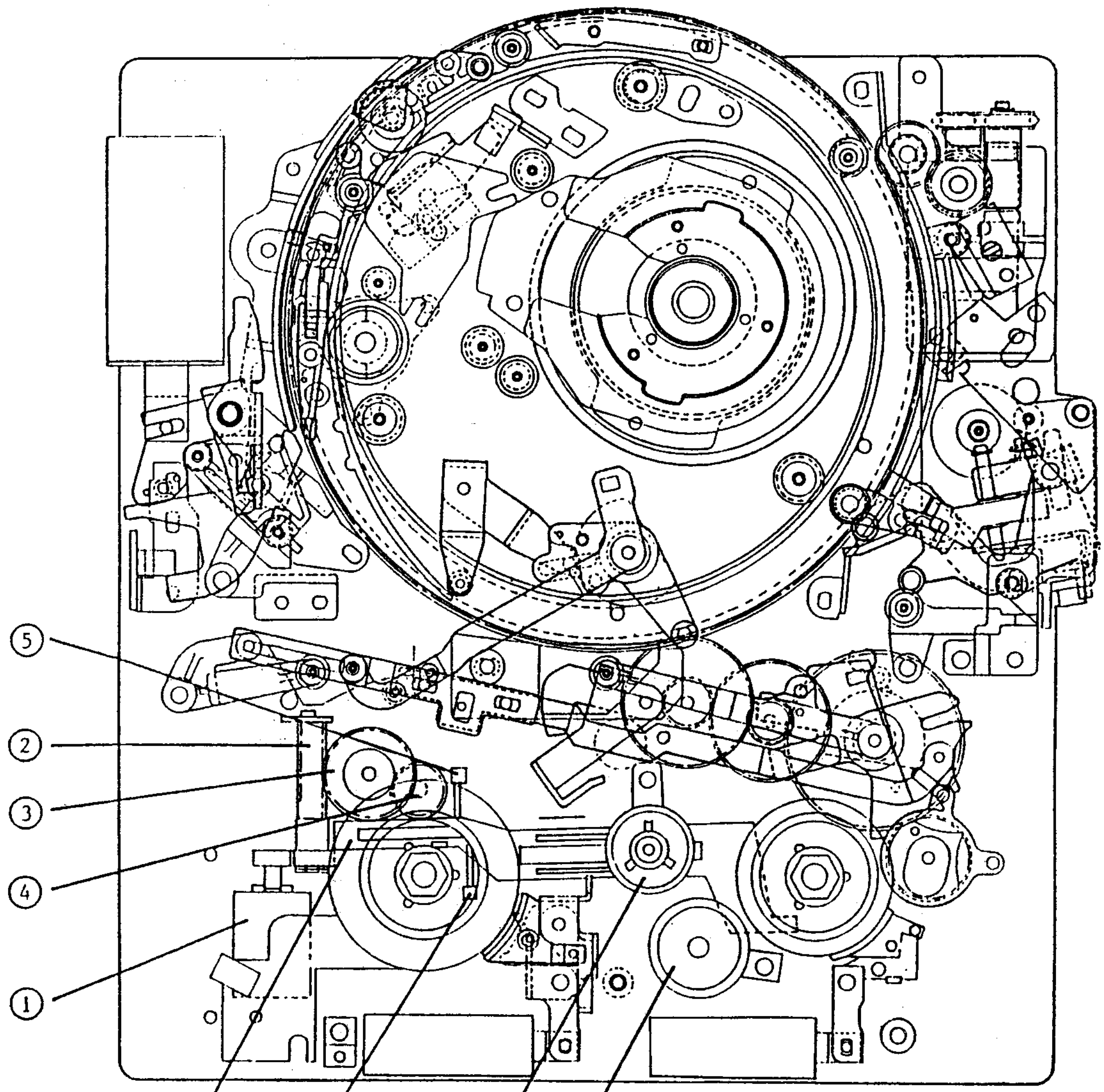
Fig. 2–3 Timing chart for small cassette reel base
(Large cassette -> small cassette)

Large cassette completion condition

Small REEL DOWN switch 5 ON



(2) Changing from a large cassette to a small cassette



Front loading unit [cassette IN switch on/cassette recognition switch off] -> small reel DOWN switch (5) on/detection -> small cassette motor (1) on/turns left -> worm gear (2) turns right -> reduction gear (3) turns left -> transfer gear (4) turn left -> slide lever (7) moves right -> [small cassette reel base (8) moves up/intermediate gear (9) presses against reel base] -> small reel UP switch (6) on -> motor (1) off.

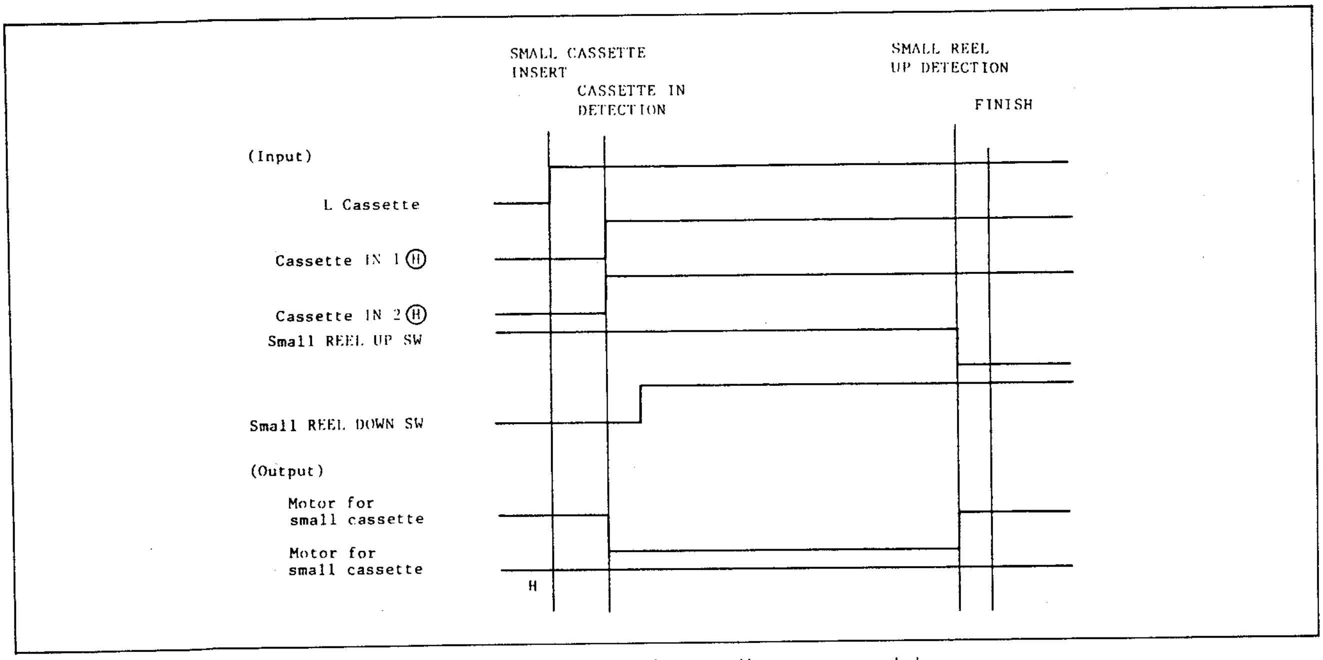
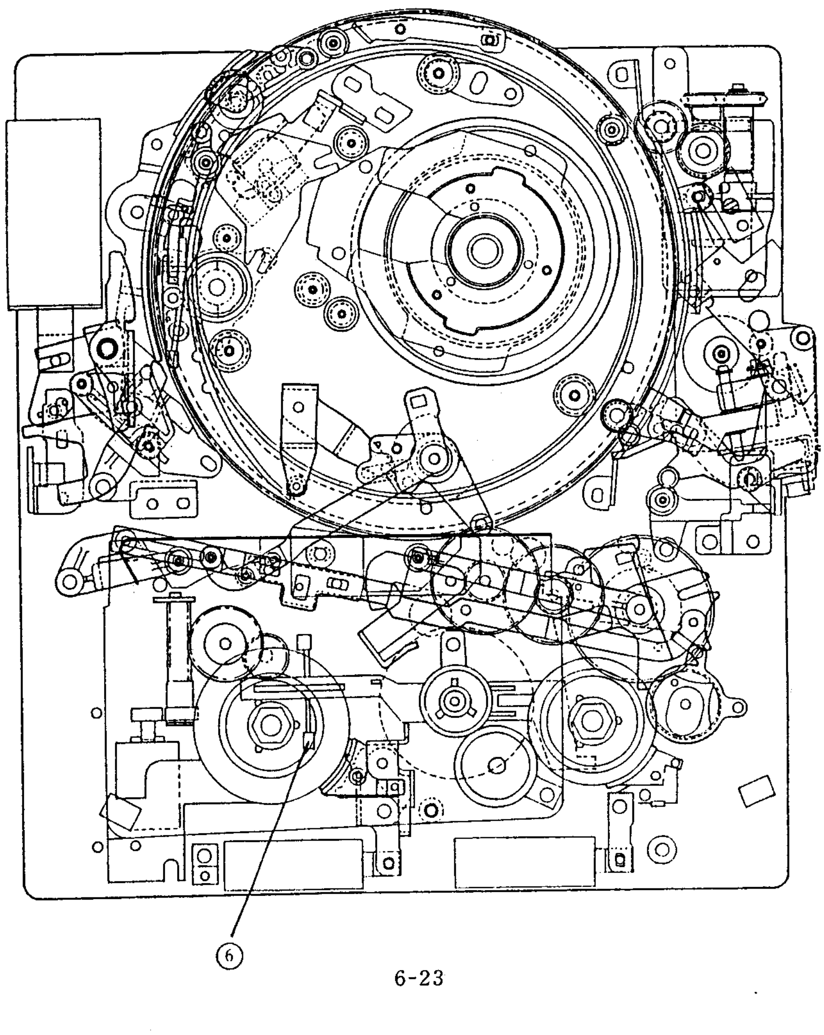


Fig. 2-4 Timing chart for small cassette reel base
(Large cassette -> small cassette)

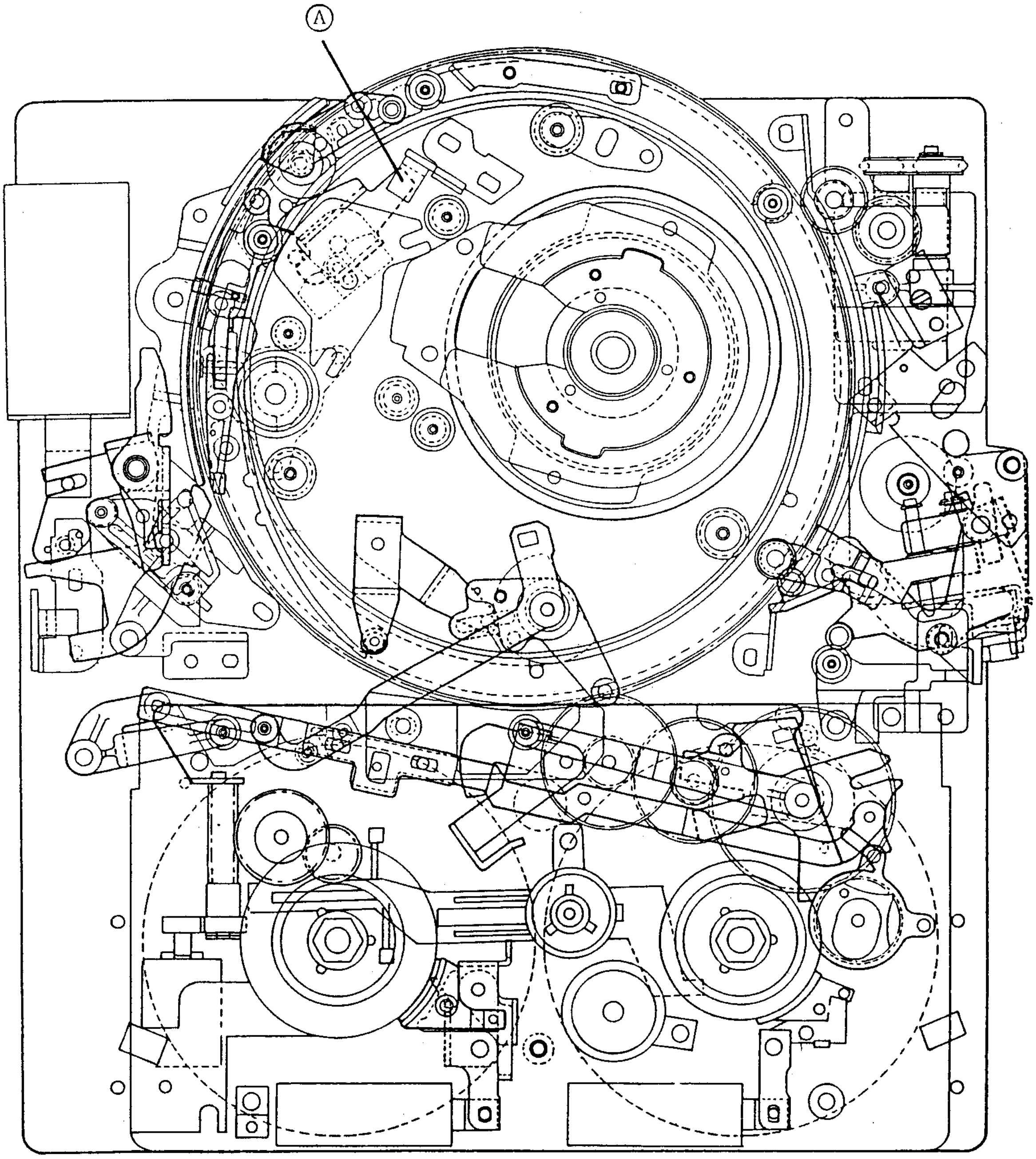
Small cassette finish condition

Small REEL UP switch 6 ON



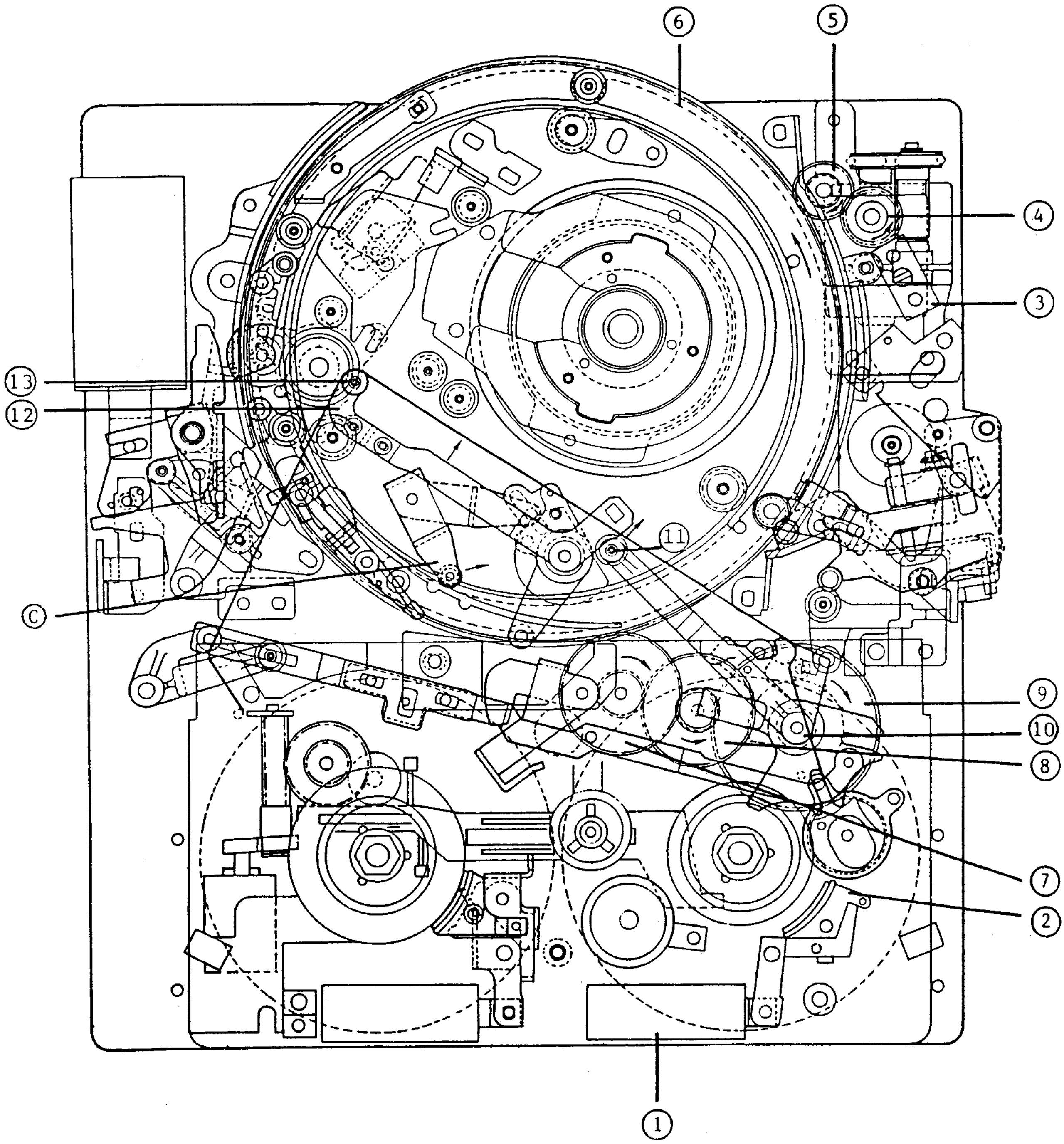
2-3. LOADING OPERATION

1. Large cassette down condition



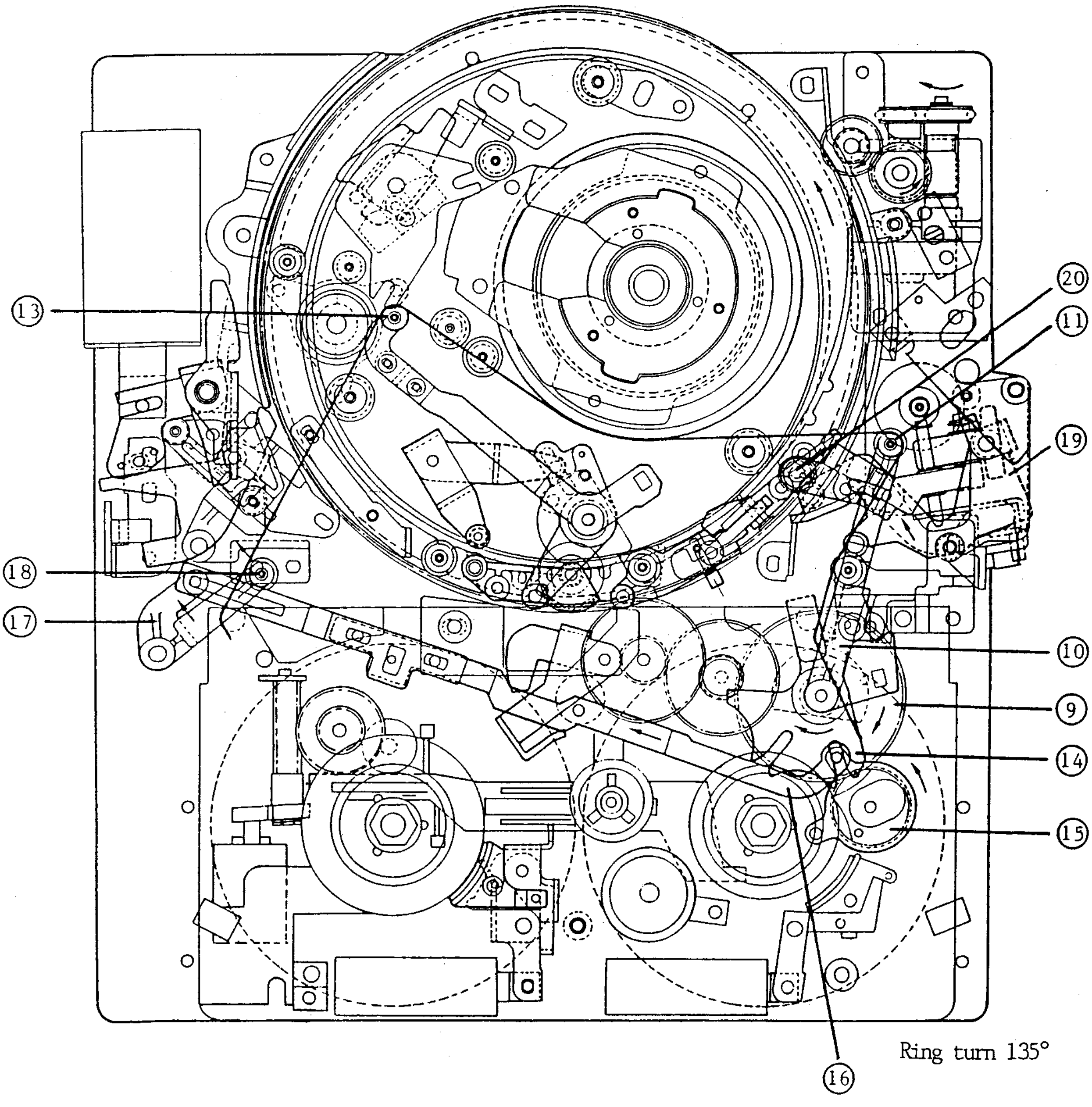
Unloading Completion sensor (A) detection.

2. Loading operation A



Take up side brake solenoid (1) on -> take up side brake (2) released -> loading motor (3) on -> intermediate gear (4) turns left -> ring drive gear (5) turns right -> loading ring (6) turns left -> subloading gear 1 (7) turns right -> subloading gear (8) turns left -> Geneva drive gear (9) turns left -> take up side tension arm (10) drives -> tape drive lever (C) -> supply side tension arm (12) drives -> tape is ejected by P2 post (13).

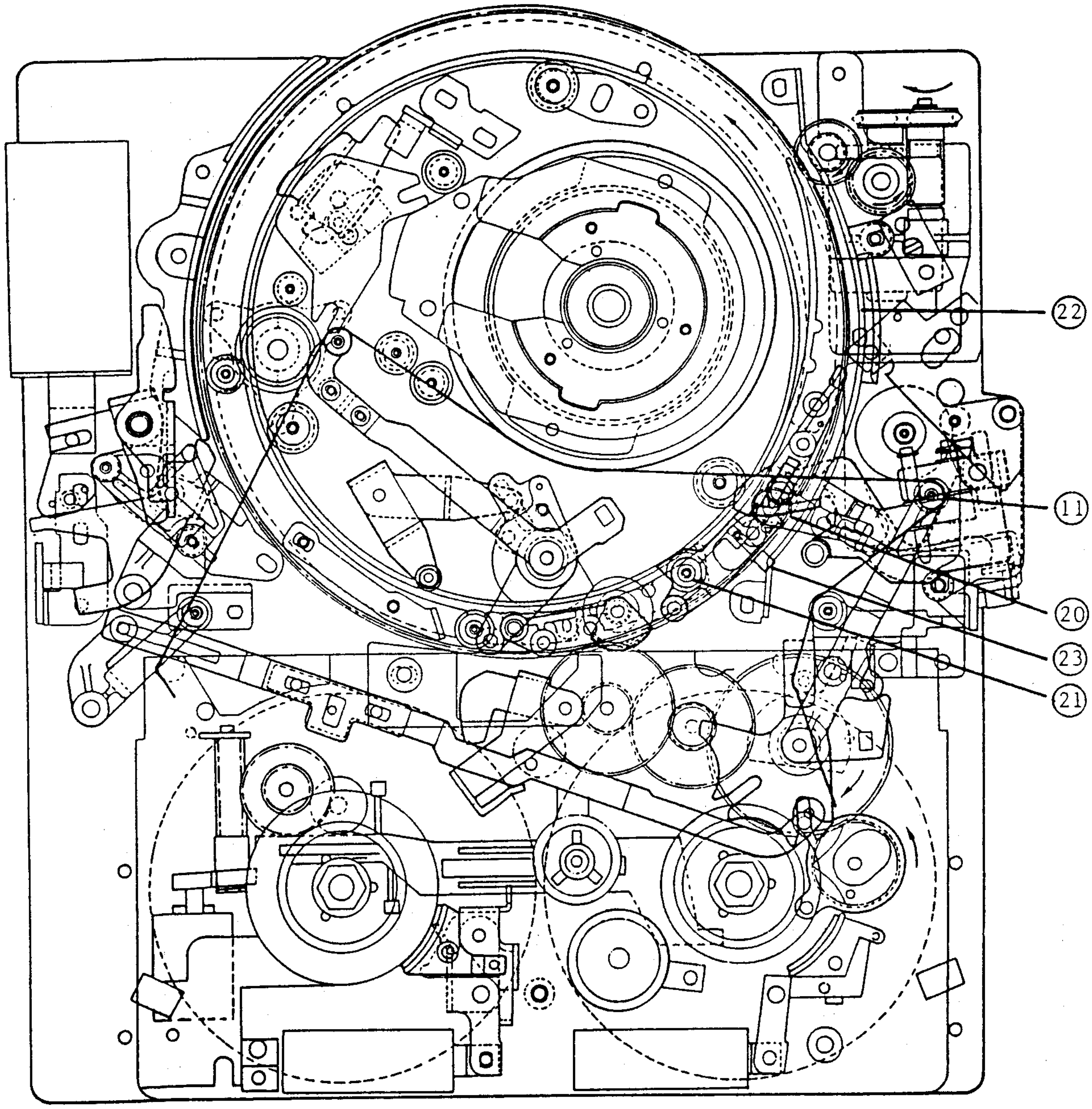
3. Loading operation B



Ring turn 135°

> P2 post (13) finishes pulling out the tape.
> P11 post (11) pulls out tape during operation.
> Pull arm for P10 turns right from point 135 degrees to loading -> P10 post (20) starts to move down.
> Take up side tension Geneva gear (14) turns right -> [take up side tension Geneva gear (15) turns left/P1 drive rod (16) moves left] -> pull arm (17) moves left -> P1 post (18) starts pulling tape.

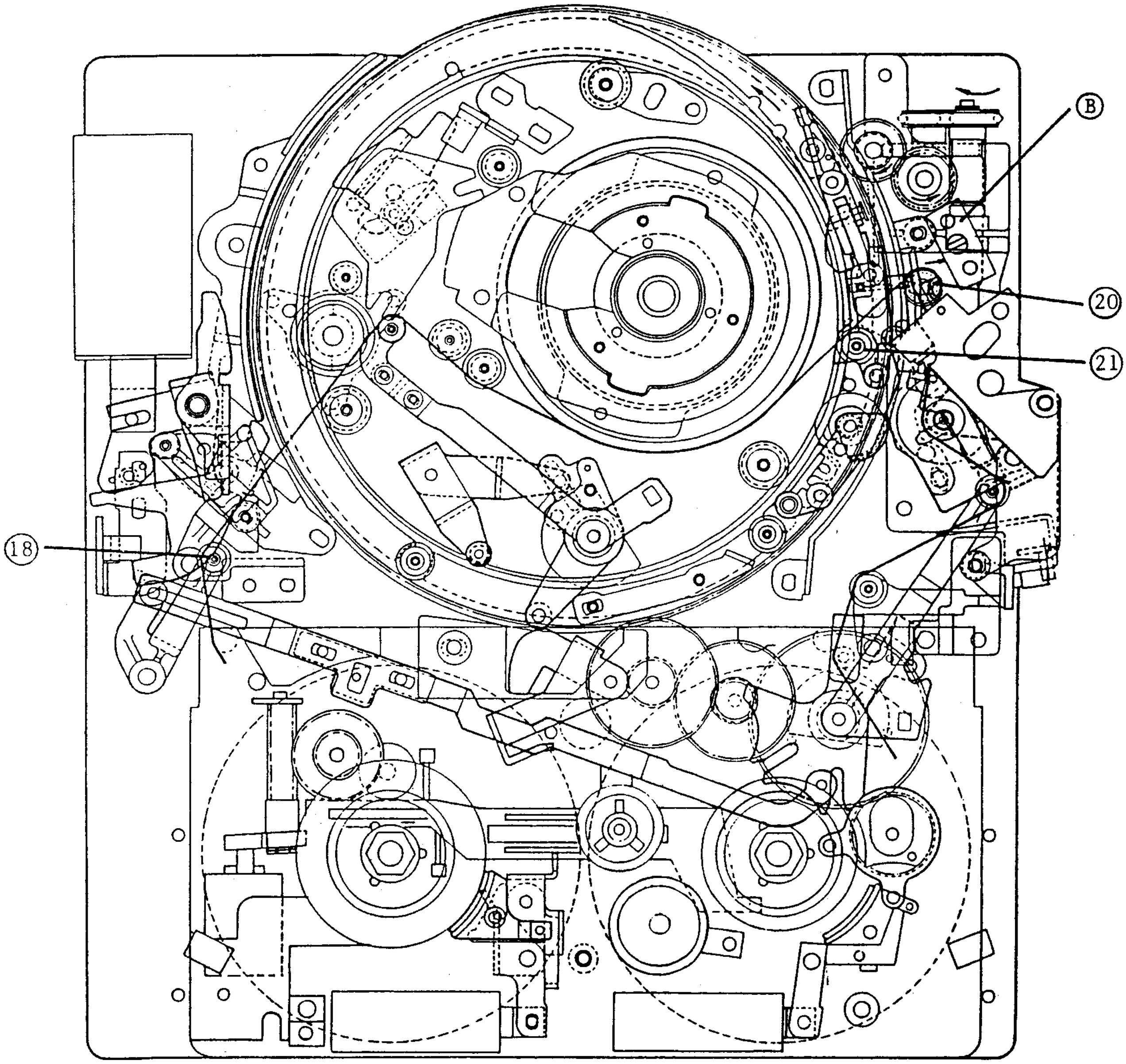
4. Loading operation C



Ring turn 153°

> P10 post (20) comes down completely.
> P11 post (10) finishes pulling out the
> P7 post (20) starts moving up [pin (23) is moved up by up lever (22) and raises P7 post.]

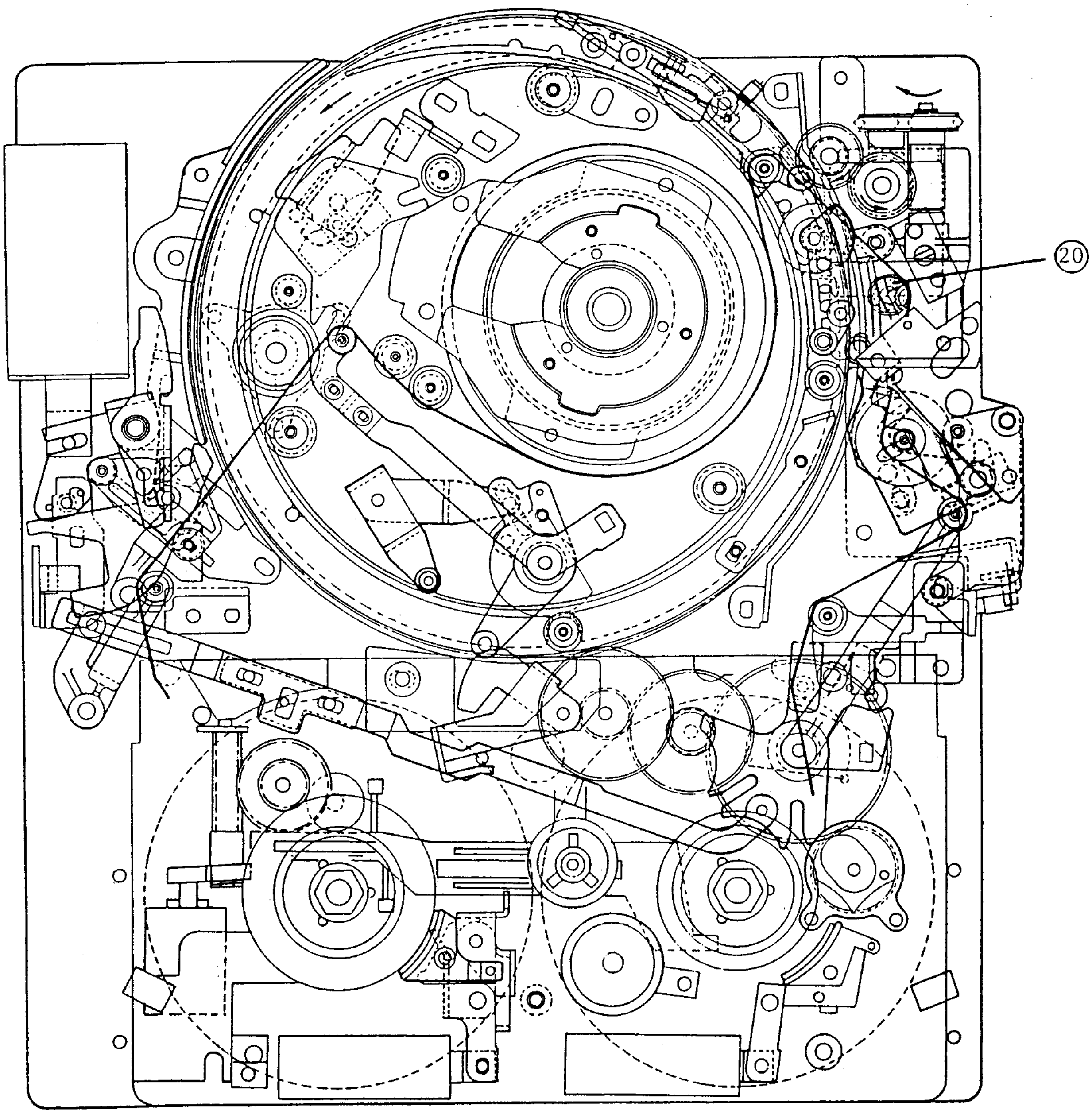
5. Loading operation D



Ring turn 203°

> P1 post (18) finishes pulling out the tape.
> P10 post (20) starts to incline to right.
> P7 post (21) starts to pull out tape.
> Loading select switch (B) activates causing the loading motor to speed up.

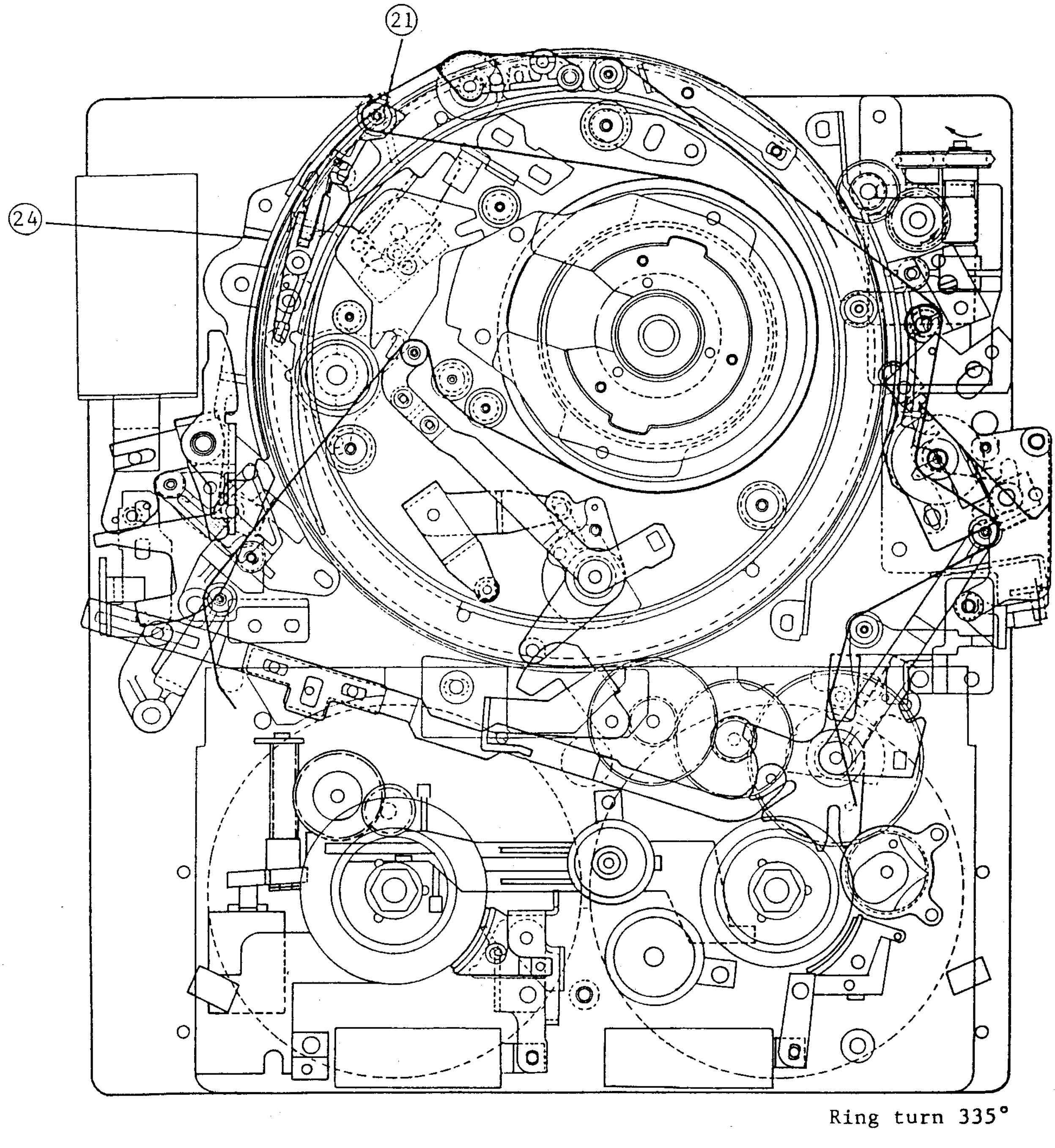
6. Loading operation E



Ring turn 243°

> P10 post (20) finishes inclining.

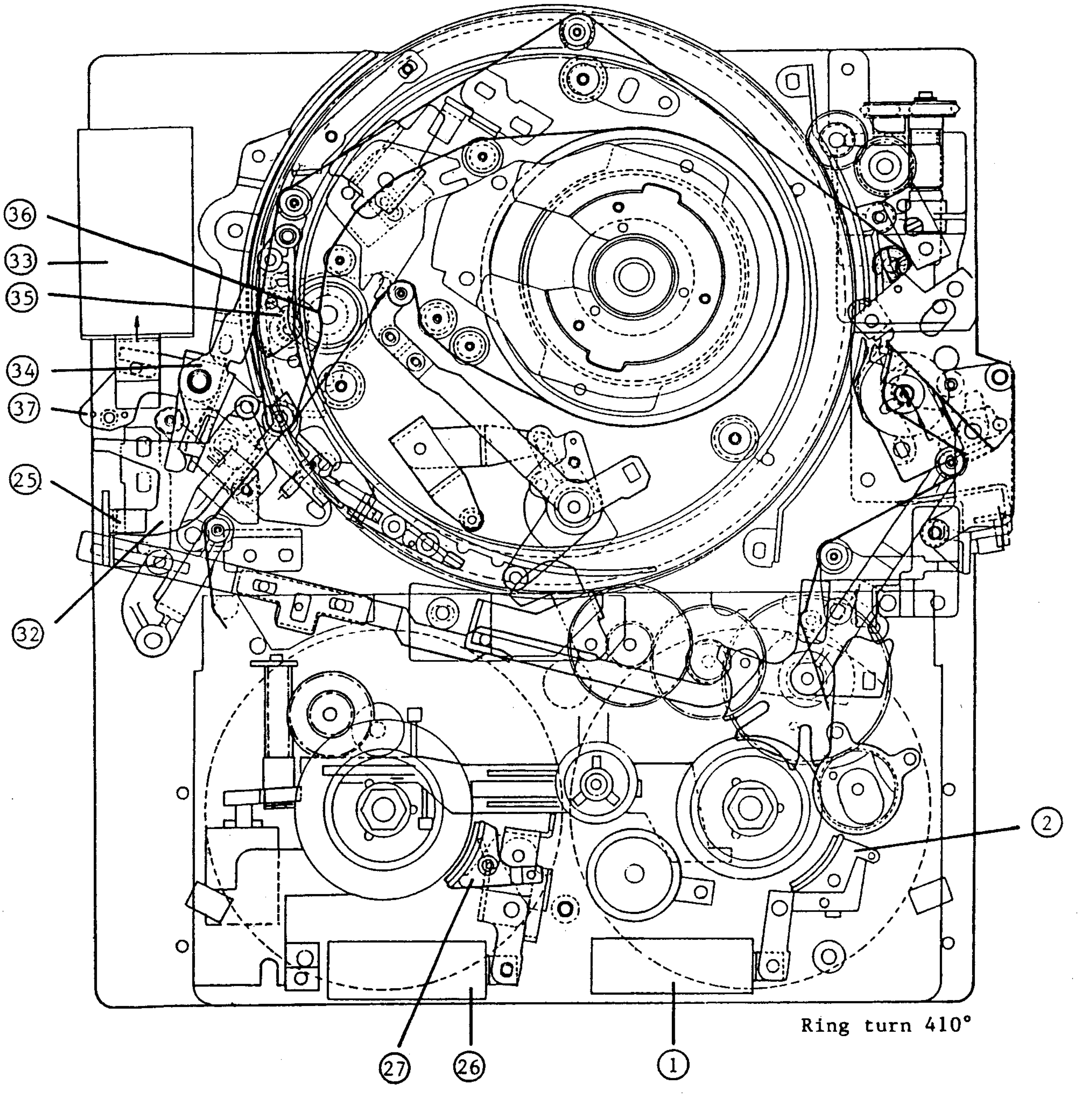
7. Loading operation F



Ring turn 335°

> P7 post (21) escapes from the ring via the ring outside guide (24).

8. Loading completion



> Loading finishes when detected the loading completion sensor (25).
> Supply side solenoid (26) operates -> supply side brake (27) is release.

> Loading completion detection arm (32) moves pinch roller drive lever (37).
> Pinch roller solenoid (33) operates -> pinch roller pressure arm (34) causes pinch roller (35) to press against capstan shaft (36).

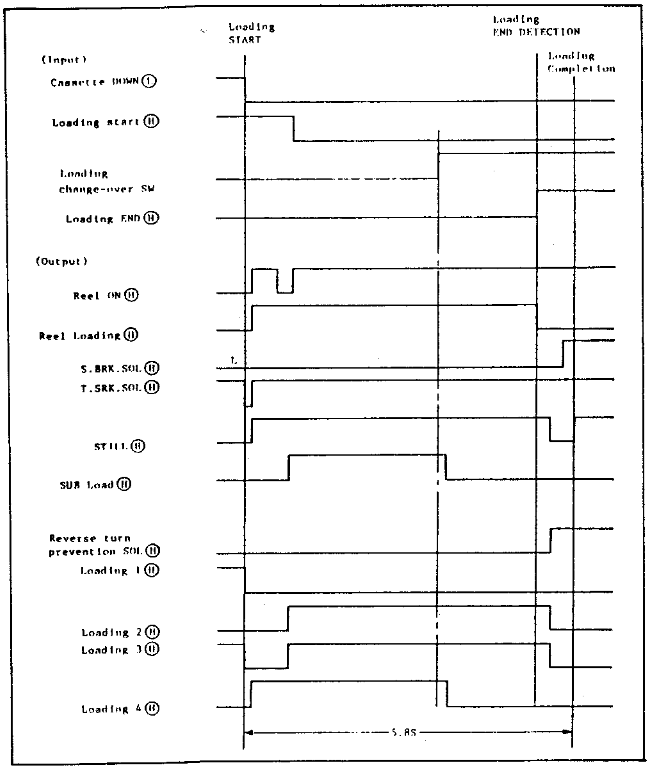


Fig. 2–5 Loading timing chart

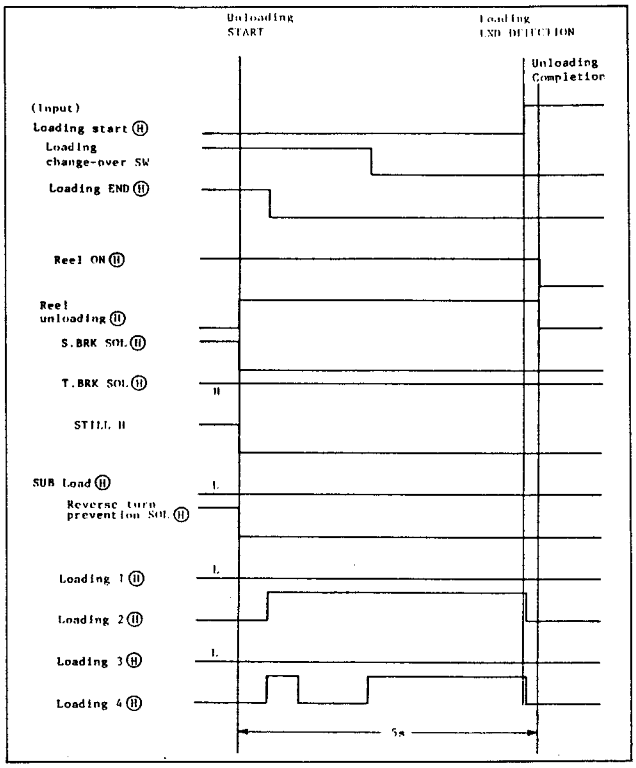
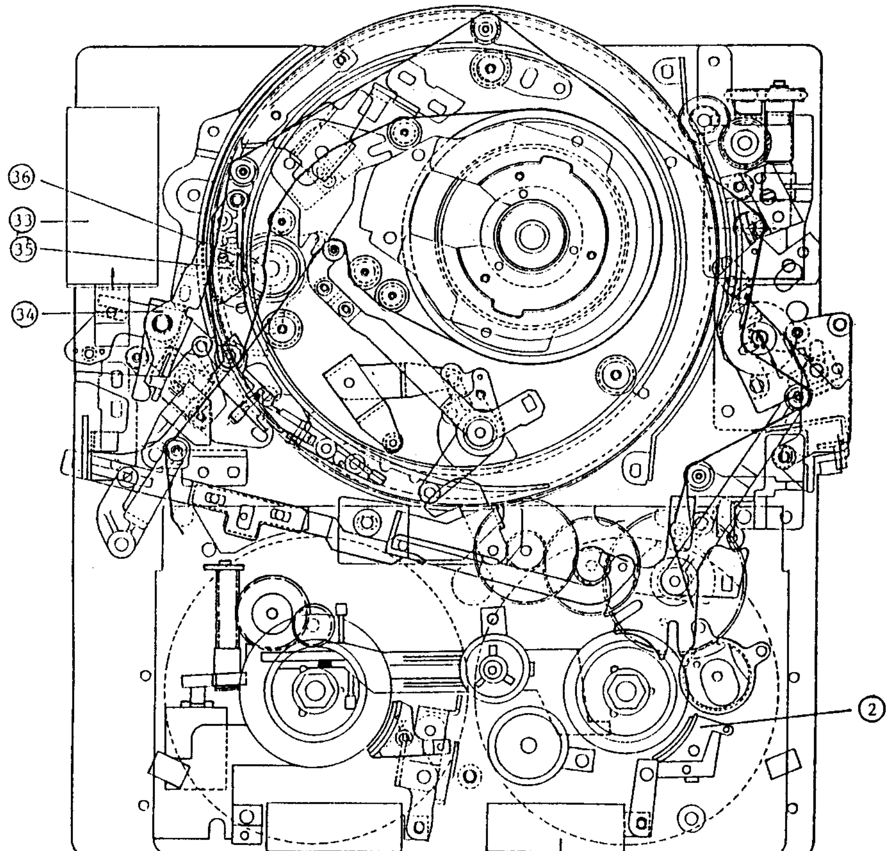


Fig. 2–6 Unloading timing chart



PLAY.SLOW.JOG.SHUTTLE (-x4 - x4)

①

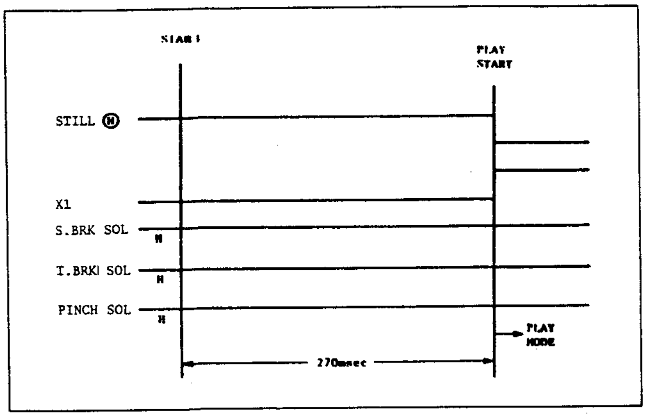


Fig. 2-8 STOP -> FF, REW mode timing

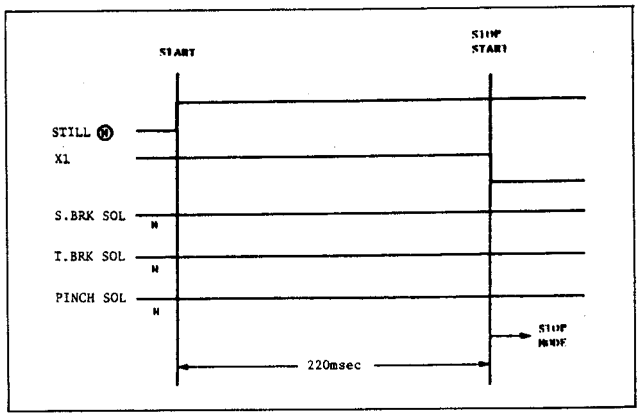
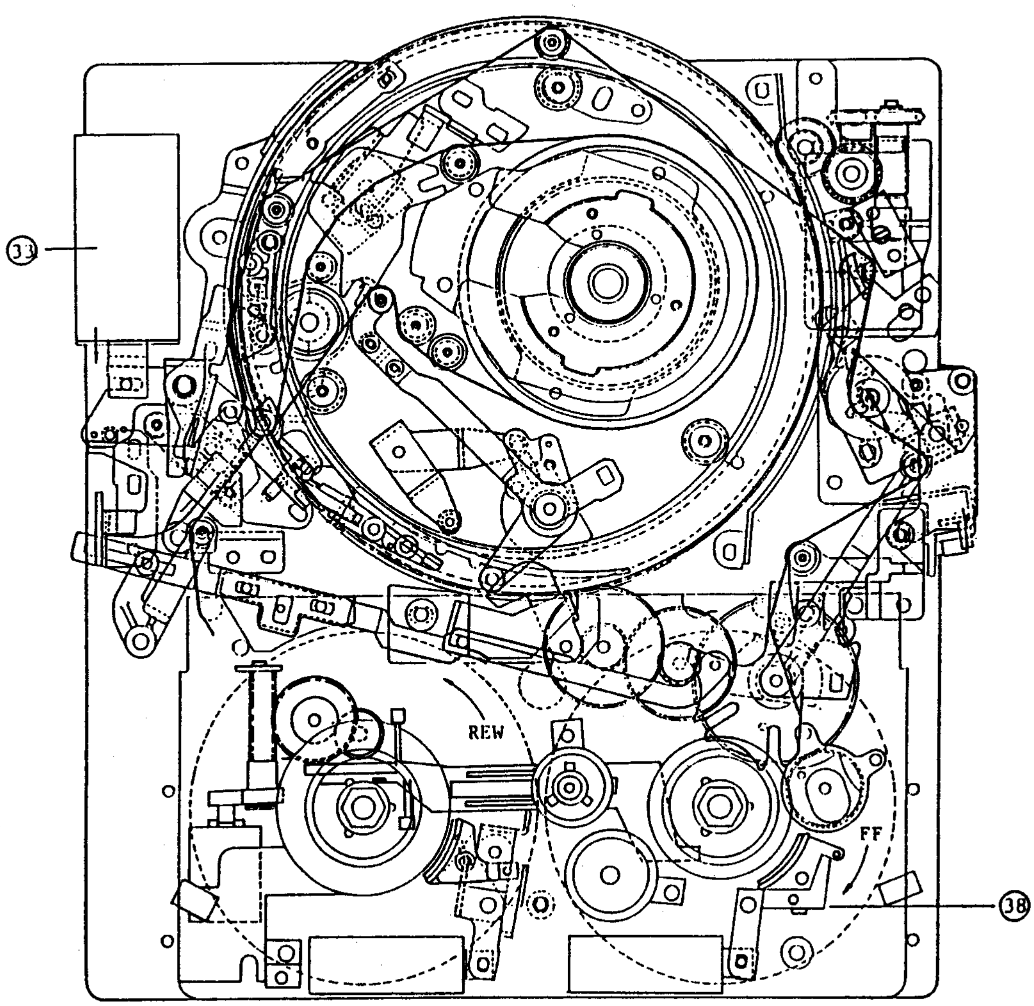


Fig. 2-7 Play -> stop mode timing



SHUTTLE

> Pinch roller solenoid (33) releases, and the FF mode is set by take up reel motor (38) in FF, or the REW mode is set by the supply reel motor (37) in −x32.

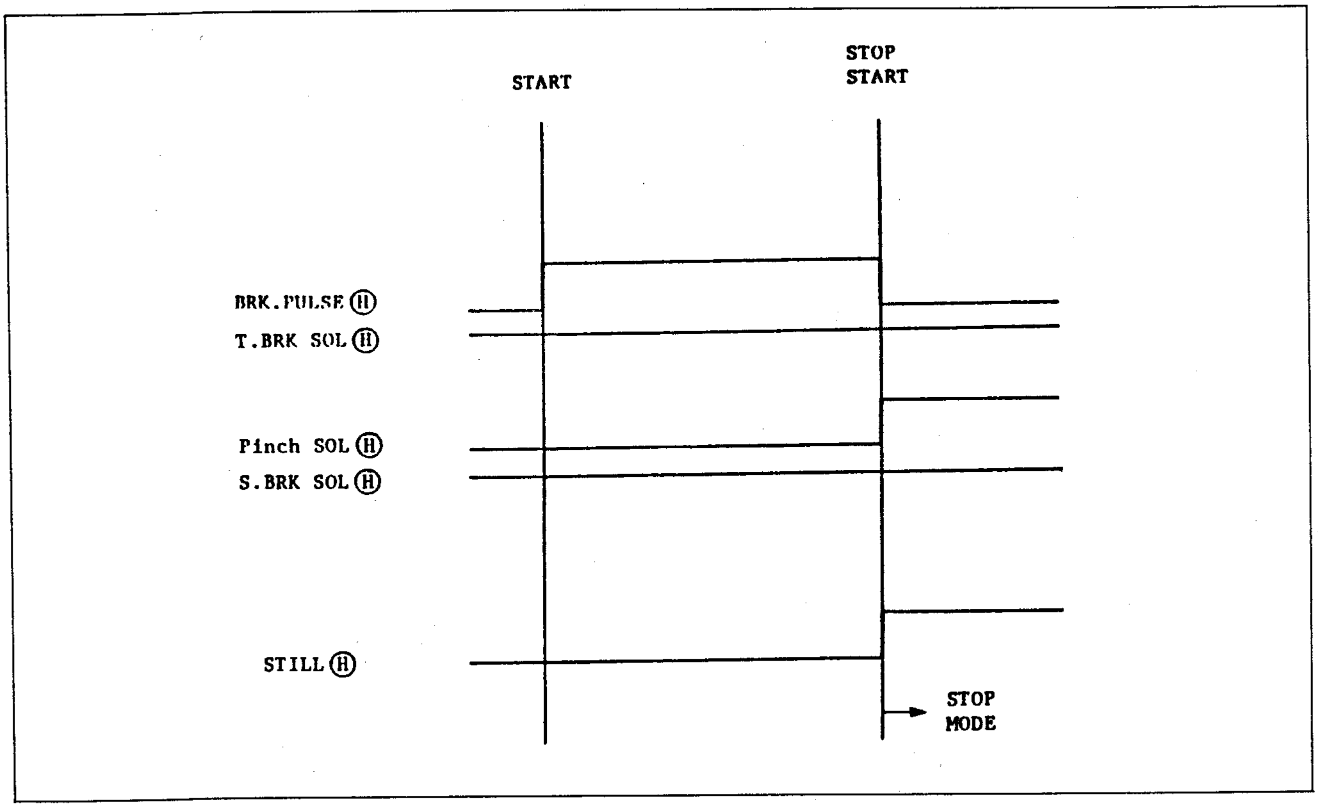


Fig.2-9 FF,REW → STOPmode timing chart

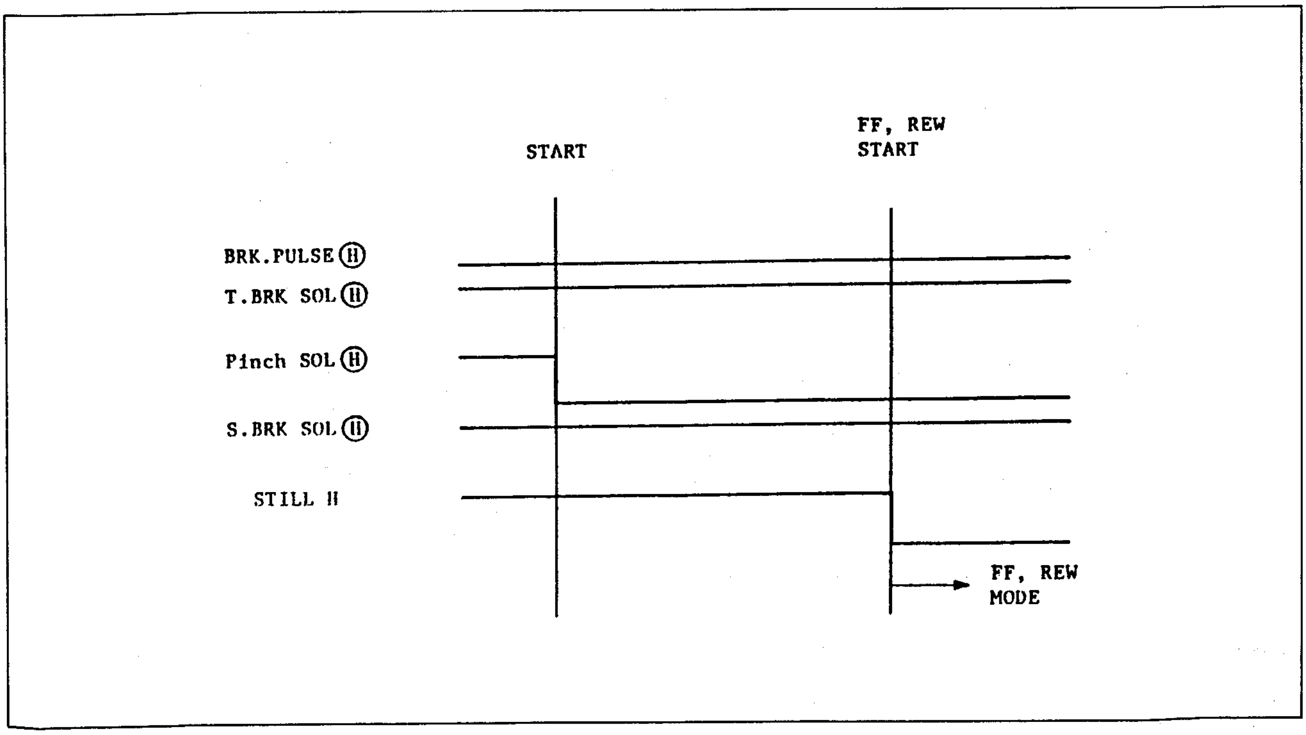


Fig.2-10 STOP → FF, REW mode timing

3. SYSTEM CONTROL

The system control is made up of 3 CPUs. The master processor for system control is a uPD780C (Z80).
The CPU controls the VITC & LTC board and the second controls the front panel C board .
The main CPU (Z-80) is connected to the other CPUs on the other boards through serial data links. Data communication between the front panel and syscon consists mainly of data relating to keyboard input and information for the display tube. Communication between the VITC & LTC board and syscon consists mainly of time code reader and generator data.
The overall Block diagram of the system control circuits is shown in Figure 3-1(a), and the simplified Block diagram of the main CPU circuits is shown in Figure. 3-1(b).

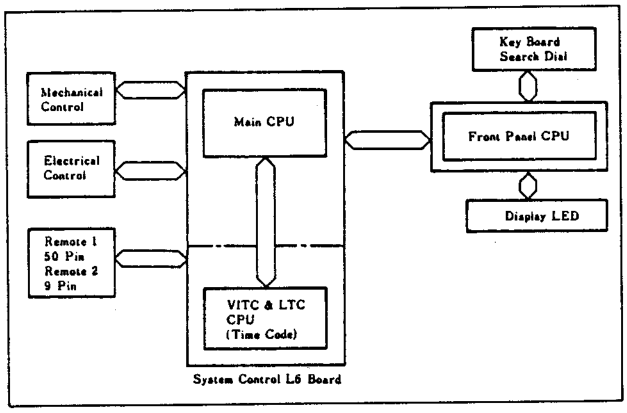


Fig. 3-1(a) System Control Overall Block Diagram

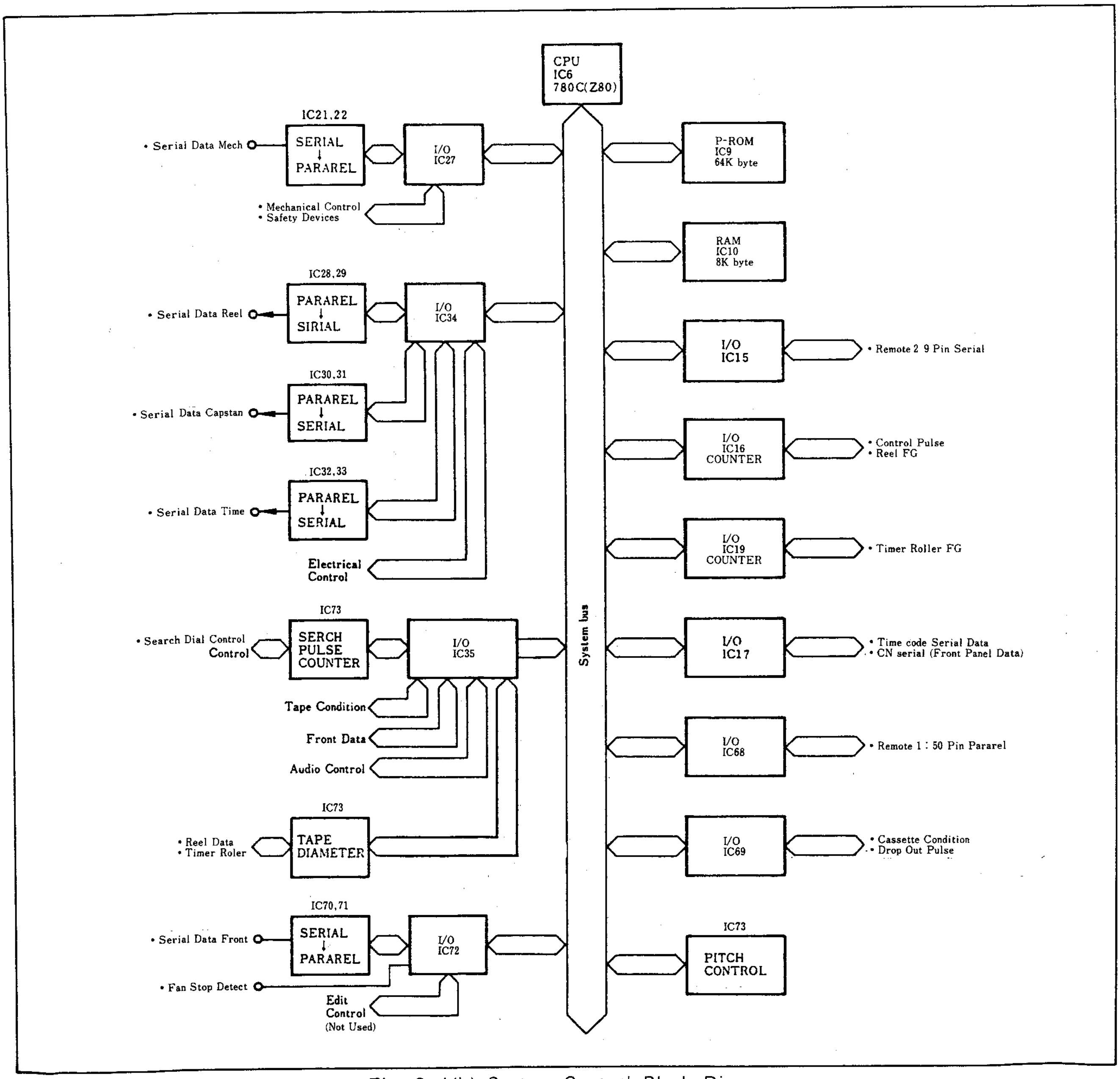


Fig. 3-1(b) System Control Block Diagram

3-1. Z80 CPU

The main CPU used in this unit is a uPD780C (Z80 microprocessor). This Z80 microprocessor is a single-chip 8-bit processor with an instruction set of 158 basic commands (including all seventy-eight 8080A commands with which it is machine language compatible).
17 internal registers are available for data processing and addressing. Both static and dynamic memory can be interfaced using very little external circuitry. 3-modes of maskable and nonmaskable interrupt functions can be handled by this processor in addition, all inputs and outputs are TTL compatible, and only a signal +5V power supply and single-phase clock are needed for operation.
The internal composition of the Z80 CPU is shown below.

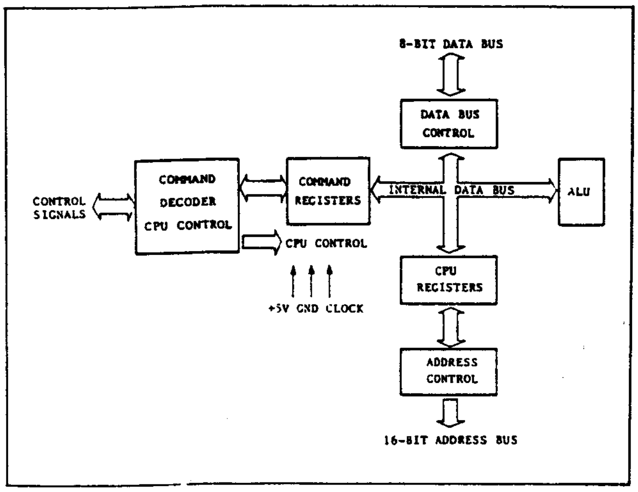


Fig. 3-2. Z80 Internal Composition

The internal registers of the Z80 CPU comprise a 207-bit read/write memory and are divided up into a general use register group and a special purpose register group.

The general use register group includes a main register set and an auxiliary register set, the contents of which can be exchanged by means of an exchange command. Each register set composes an 8-bit accumulator, an 8-bit flag register and six general use registers.
The special purpose register group comprises a program counter (PC; 16 bit), stack pointer (SP; 16 bit), two index registers (IX, IY; 16 bit), an interrupt vector address register (I; 8 bit) and a memory refresh register (R; 7 bit).
When an interrupt occurs, the interrupt vector register supplies the upper 8 bits of the indirect address of the interrupt service routine, and the lower 8 bits are supplied by the interrupt device.
The memory refresh register (R) automatically generates memory refreshing addresses when dynamic RAM is used.

The terminal signals of the Z80 CPU are below.

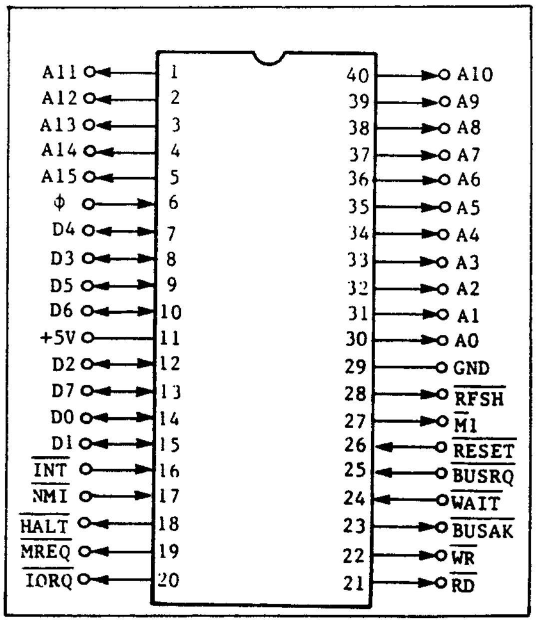


Fig. 3-4 Z80 Terminal Connectors

Main register set		Auxiliary register set		
Accumulator A	Flag F	Accumulator A'	Flag F'	
B	C	B'	C'	General use registers
D	E	D'	E'	
H	L	H'	L'	
	Interrupt Vector register I	Memory refresh Register R		Special purpose registers
	Index register IX			
	Index register IY			
	Stack pointer SP			
	Program counter PC			

Fig. 3-3 Internal Resisters

3–2. CLOCK GENERATOR

All clock signals used by the system control circuit are derived from a 8MHz crystal oscillator. Two sections of inverter IC50 are used as the oscillator/buffer to drive the various frequency dividers.
The 8MHz signal is first divided by 2 in IC1 to produce a 4MHz square wave which is then buffered by another section of IC50. This 4MHz signal is used for the CPU's clock.
A second FF in IC1 is used to produce a 2MHz clock for the CPU clock. This 2MHz signal is now applied to the 14 stage counter IC4.
3 clock signals are produced by this divider.
The divide by 64 output (Q6) produces (serial CLK) 31.25kHz.
The divide by 1024 output (Q10) produces (stable CLK) 1.95kHz. And finally the divide by 2048 output (Q11) produces (TM CLK) 976.6Hz.
The SCLK1 signal (615.38kHz) is produced using shift register IC's 16417 wired to divide the 8MHz clock by thirteen.

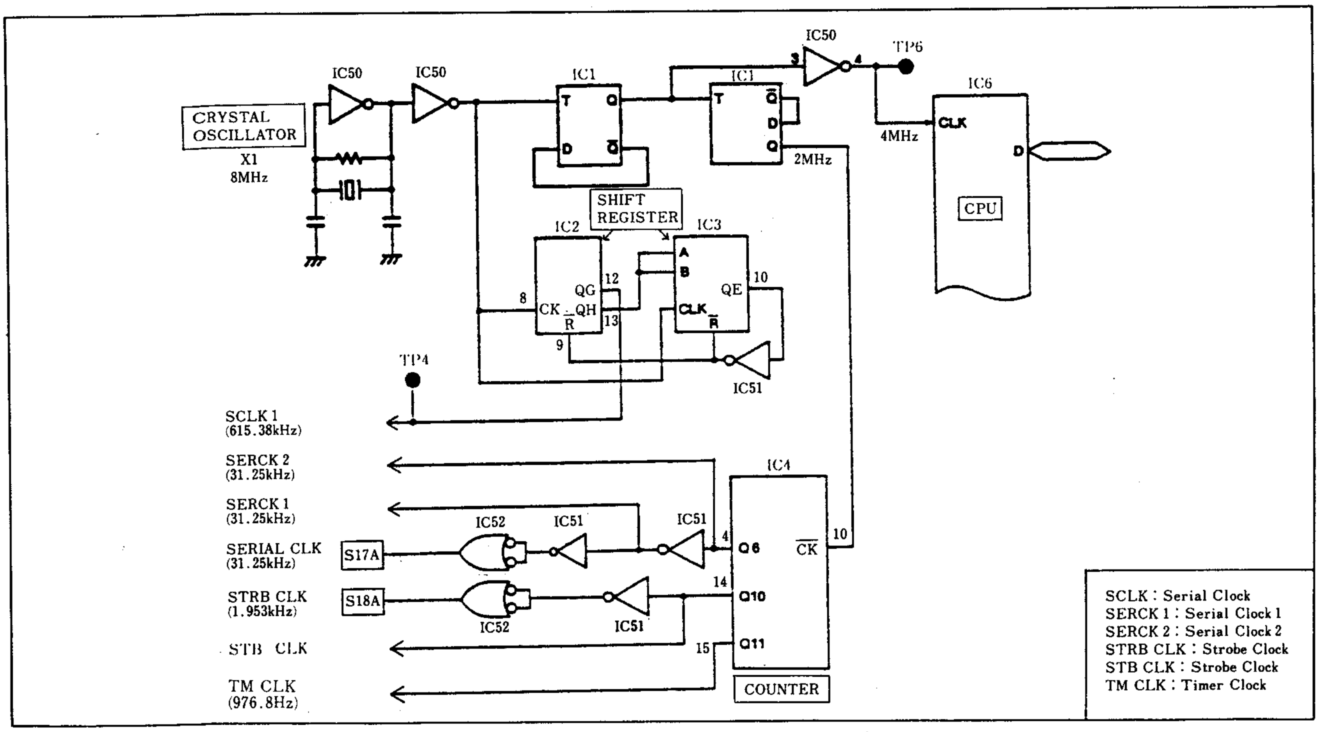


Fig. 3–5 Clock Generator Schematic

3–3. REEL SERVO CONTROL

Refer to figure 3–6.
The reel servo system is controlled by data output through I/O IC34.
Two 8 bit outputs from IC34 are converted into a 16 bit serial data word by shift registers IC's 28 and 29. This 16 bit serial data along with serial and strobe clock signals is sent to the reel servo board (L5) and is used to control the speed and torque of the reel motors during various modes of transport operation.

Information from the reel servo to system control is first converted to 8 bit parallel form by the Reel data process gate array IC73. The data is now passed to the system bus through PIA's IC's 5 and 27. Data on supply and take–up reel speed and direction of rotation along with timer roller direction data are used by the CPU to calculate tape pack diameter, tape remaining time and as confirmation of mode commands sent by the CPU to the reel servo.

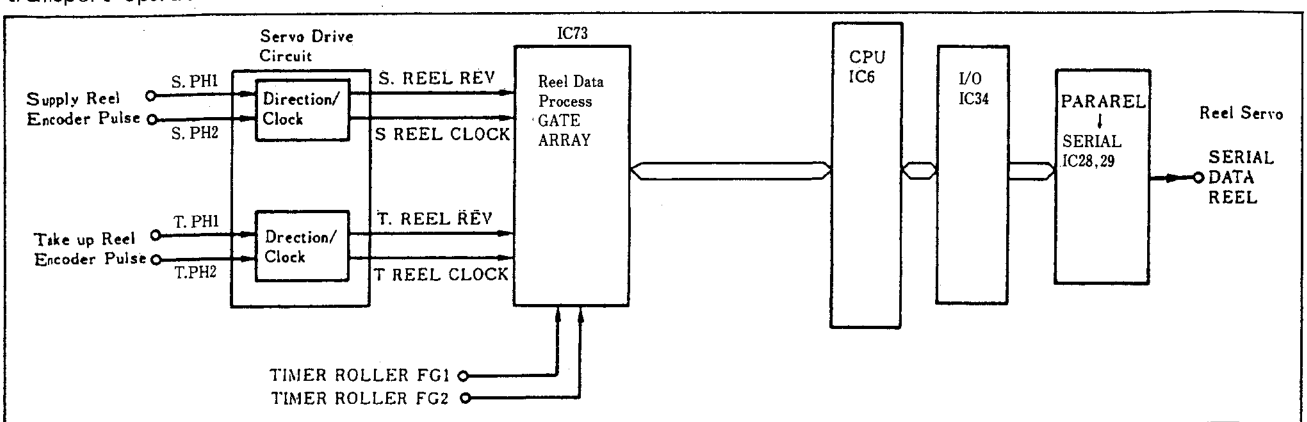


Fig. 3–6 Reel Servo Control Schematic

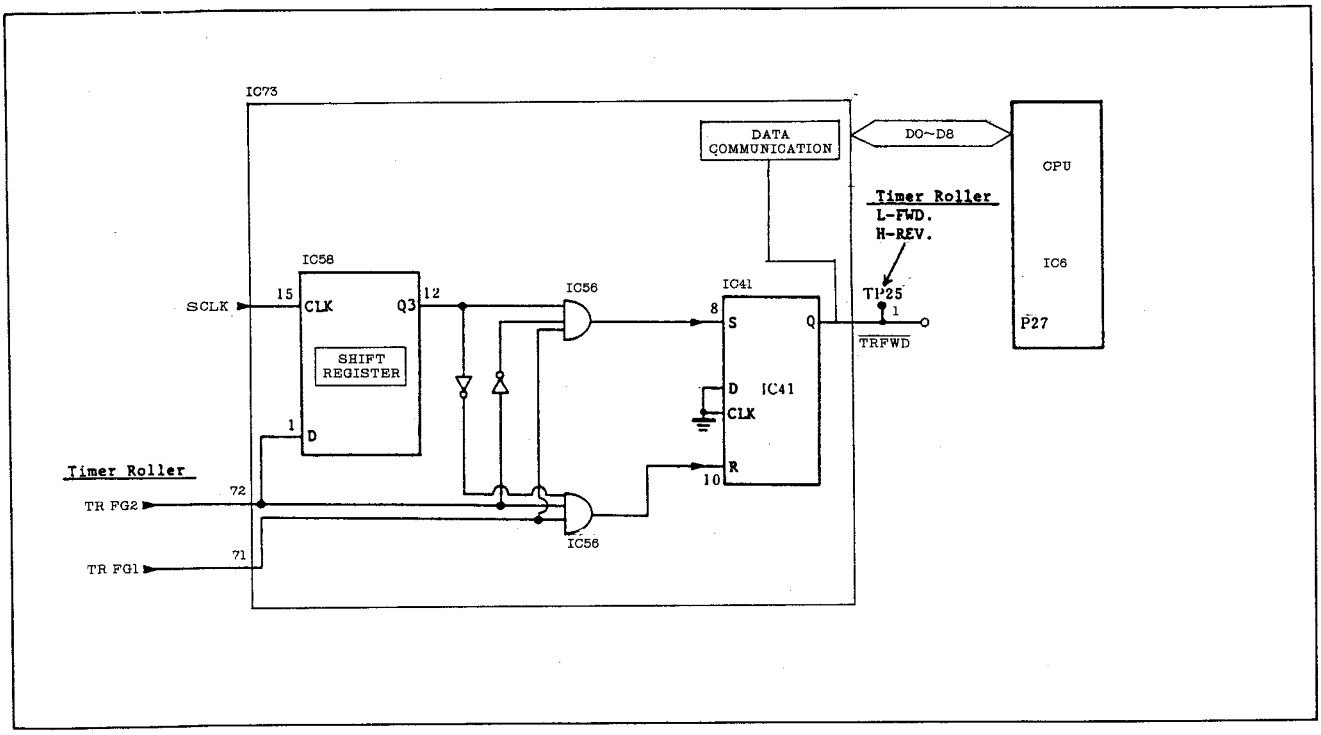


Fig. 3-7 Timer Roller Direction Detection circuit

3-4. TIMER ROLLER DIRECTION DETECTION

This circuit is used to detect the timer roller's direction of rotation. The system control uses direction information from the timer roller to confirm tape movement and also to calculate tape pack diameter. For example: If the timer roller is rotating differently than it should be for a particular mode, system control will place the unit into the AUTO OFF mode and the message "reel drive error" --- "E-19" will be displayed.
Rotation detection is done as follows:
The timer roller uses a slotted disk and two offset photo transistors which produce output waveforms (FG1 & FG2) which are 90 degrees out of phase. These waveforms are sent to the circuit shown in figure 3-6. FG2 is delayed slightly using shift register (IC58) and SCLK2 (76.8kHz). Delayed FG2, inverted FG2, and FG1 are sent to AND gate (IC56). If rotation is in the REV direction, this gate outputs a pulse which is sent to the set input of FF (IC41) this will cause the output (pin 13) to go(H). This signal is input to (pin 34) port C of IC44. For forward rotation, FG1, FG2, and delayed and inverted FG2 are sent to a second and gate. This gates output is applied to the reset input of FF IC41. The output will go (L) for FWD Rotation.
If the microprocessor issues a FWD command and a (L) FWD signal is not input to the CPU IC6 within 5 seconds. This VTR will be placed into the AUTO OFF mode.

3-5. REEL LOCK DETECTION

This circuit is used to detect reel motion during the 1/32~X4 FWD or REV modes.
If the reels should stop turning for any reason, (motor failure, servo problem, tape jam, etc) the system control will place the deck into the AUTO OFF mode in order to prevent tape damage.
In the FWD direction the take up reel FG is sensed in REV. The supply reels FG is used. Refer to the schematic diagram in figure 3-8 (FWD direction). The take up reels FG is sent to one input (pin 9) of NAND gate IC61. The other input of this gate (pin 6) is held high by the takeup reel REV (L) signal. FG pulses are output from pin 4 and pass through a second section of IC61 and then are used to clock FF IC41. When IC41 is clocked its output (pin 1) goes high. This FF is periodically reset by a timer output pulse. The frequency of this pulse is changed with the tape speed. If reel pulses are missing, output of IC41 will go low.
This low is sensed by the microprocessor through D0 ~ D7 of Gate Array IC73. If this signal remains low for more than 3 seconds the unit will be stopped. In the REV mode, the supply reel FG signal is used to clock the FF. The take-up FG is inhibited by the take-up reel REV low signal.
Timing diagram is shown in figure 3-8(b).

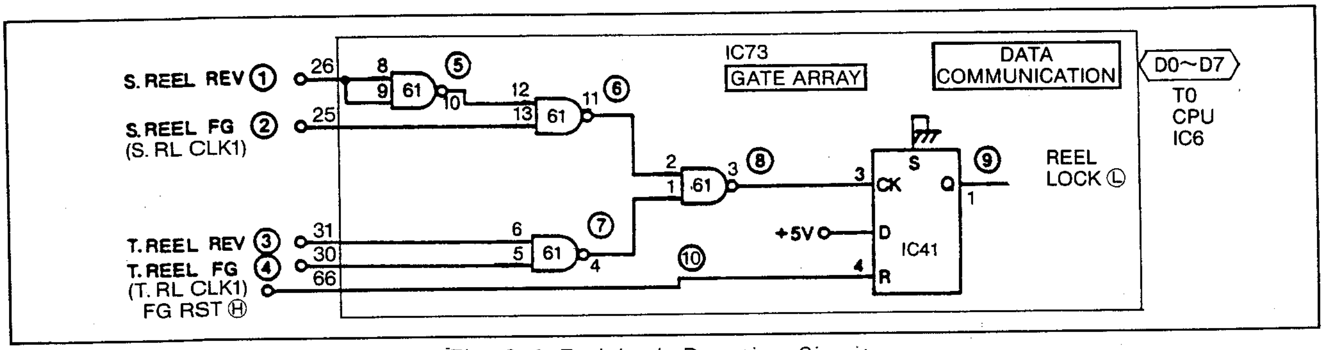


Fig. 3–8 Reel Lock Detection Circuit

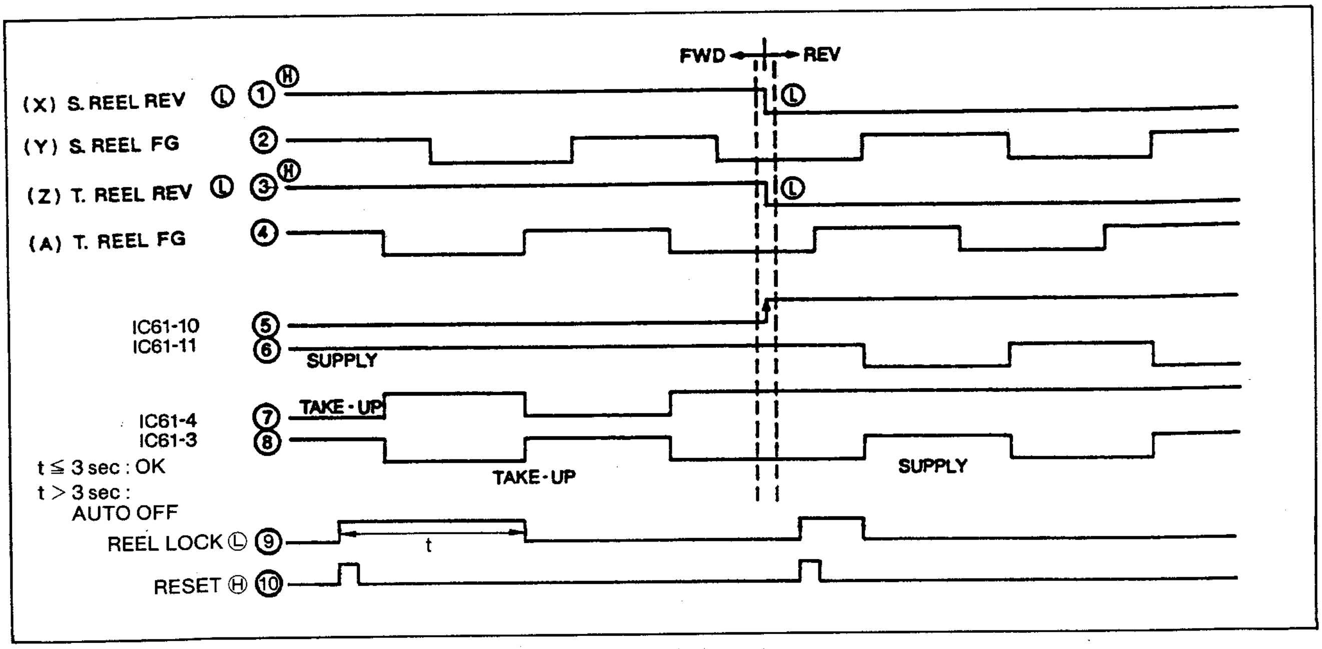


Fig. 3–8B Reel Rotation

3–6. TAPE DIAMETER DETECTOR

This circuit is used to calculate the tape diameter of both the take–up and supply side. This information is then used to control the tension in the reel drive circuit.
Calculation of the tape diameter of a reel is based upon a count of the number of timer roller pulse that occur in the timer of one reel rotation. To detect this number, the reel encoder pulses are divided by 32 to provide successive triggers (for the strobe and reset of the counter) that occur once for each complete revolution of the reel. Starting at a reset point, timer roller pulses are counted until the next strobe pulse. This count is then latched and the counter is immediately reset and enabled again for the next count.

The system control microprocessor uses the counter values obtained from both reels in order to calculate the supply and take–up tape diameter. This information will now be used to control the speed and torque values for the reel motors.

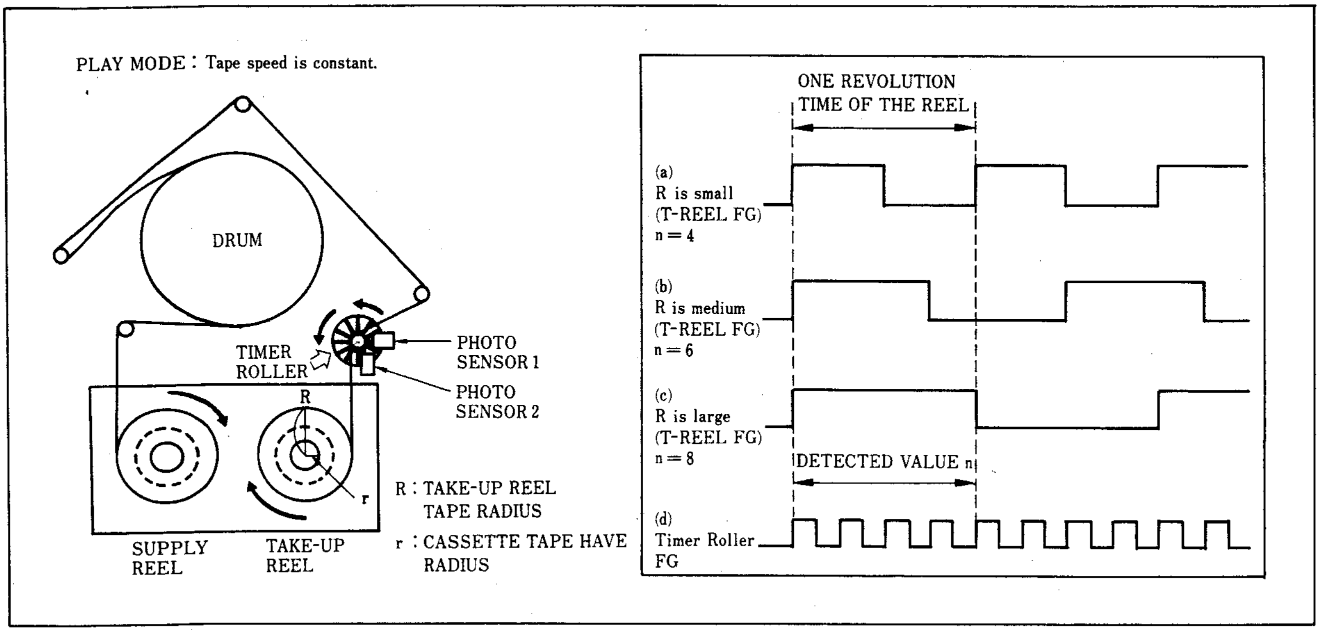


Fig. 3-9 Tape Diameter Detection System

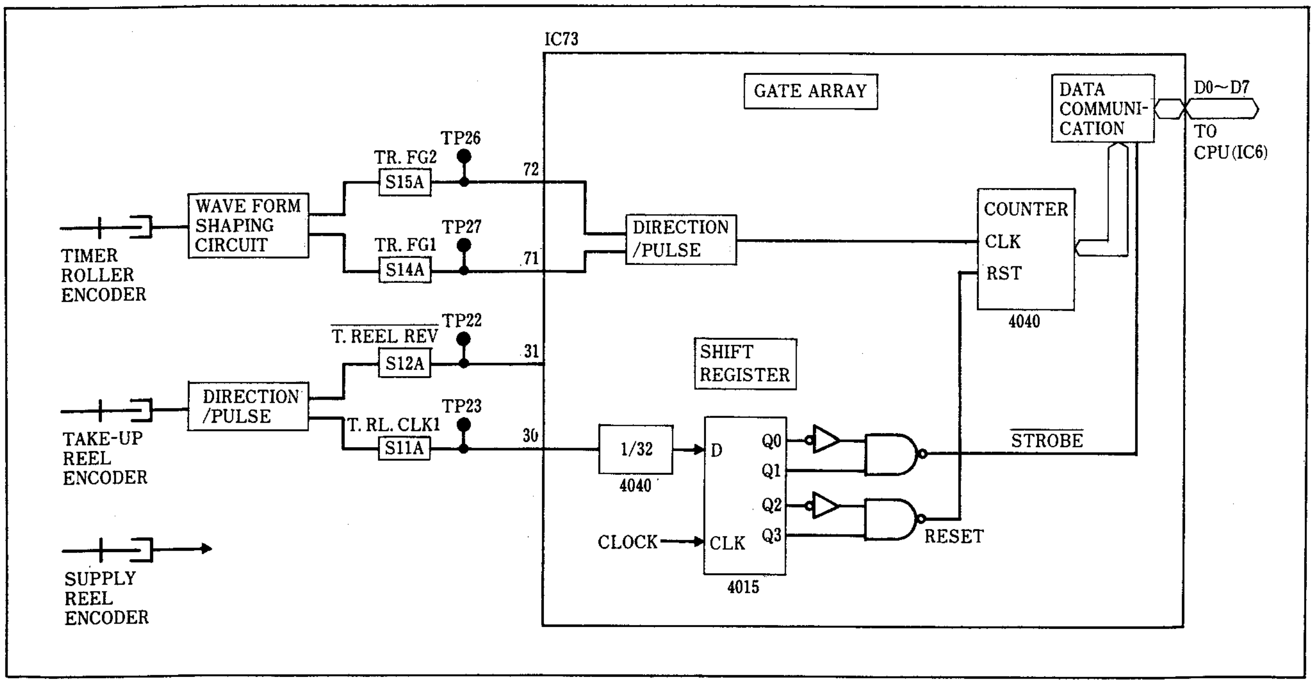


Fig. 3-10 Tape Diameter Detection System

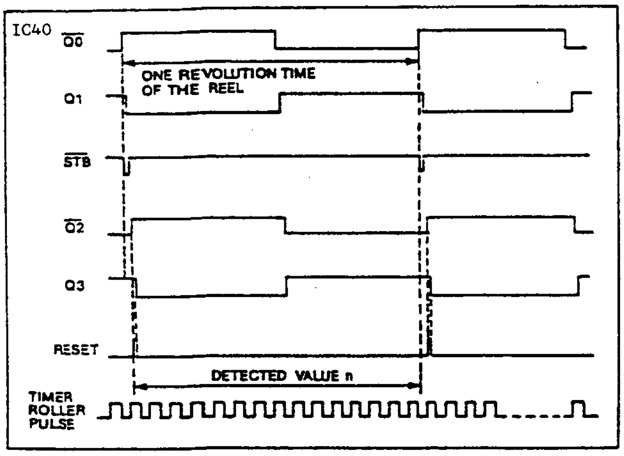


Fig. 3-11 Tape Diameter Detection Timing

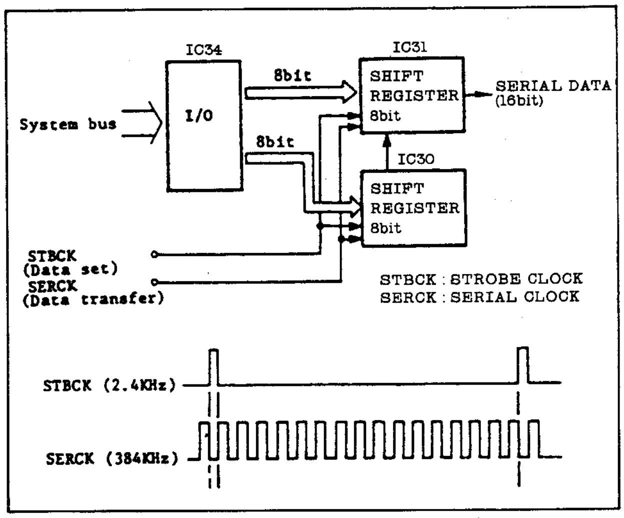


Fig. 3-13 Capstan Servo Timing

3-7. CAPSTAN SERVO CONTROL

Capstan servo control is performed using system bus data which is output through I/O IC34. Block diagram in figure 3-12, the two 8 bit data words are converted into 16 bit serial data by shift registers ICs 30 and 31, using a 1.953kHz strobe clock and a 31.25kHz serial clock.
Timing of the parallel to serial conversion is shown in figure 3-13. As with the reel servo, the strobe clock and serial clock are sent along with the 16 bit serial data in order to perform serial to parallel conversion on the capstan board (L5).
The data sent from system control is used to send the speed, and direction of rotation of the capstan motor in all modes from still to X4.

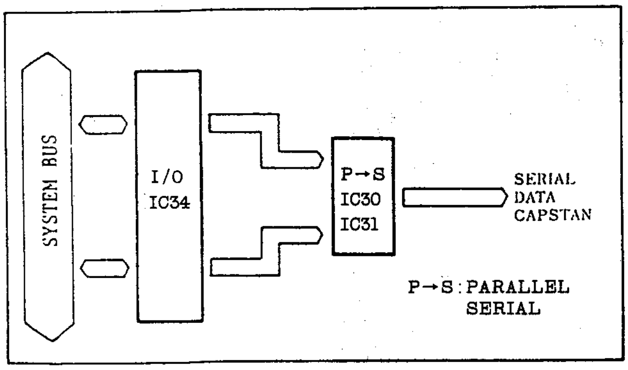


Fig. 3-12 Capstan Servo Block Diagram

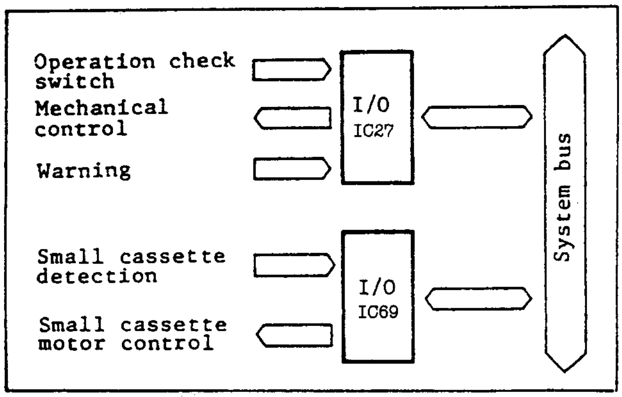


Fig. 3-14 Mechanical Control Block Diagram

3-8. MECHANICAL CONTROL

Mechanical drive control and transport status sensing is performed through I/O ICs 27 and 69. Status information such as: carriage up/down, cassette in, cassette size, tape type, loading completion, tape beginning/end, etc is produced by the various mechanical and optical sensors located on the transport mechanism. See figures 3-16 and 3-17.
Refer to chart figure 3-18.
The main CPU will issue drive commands to the various transport motors and solenoids to carry out the desired operation. Drive commands are sent from port of I/O IC27 and IC34 to the power drive board (S10). Refer to chart figure 3-15. It shows the modes and motors and solenoid controll.

Mechanism Operation by mode is as shown below.

MODE / MOTOR /SOLENOID	CASSETTE IN ↓ LOADING	STANBY	STANBY OFF	STILL	SEARCH – x 4	SEATCH x8 – x32	JOG	SLOW	PLAY	EJECT	I/O PORT
ELEVATOR MOTOR	○	×	×	×	×	×	×	×	×	○	IC27–38.39 P20.P21
LOADING MOTOR	○	×	×	×	×	×	×	×	×	○	IC27–40.43 P22.P23
S-SIDE BRAKE SOLENOID	×	○	×	○	○	○	○	○	○	×	IC27–36 P25
T-SIDE BRAKE SOLENOID	○	×	×	○	○	○	○	○	○	○	IC27–35 P26
S-SIDE REEL MOTOR	○	○	○	○	○	○	○	○	○	○	IC34–28 P00
T-SIDE REEL MOTOR	○	○	○	○	○	○	○	○	○	○	IC34–28 P00
CAPSTAN MOTOR	×	×	×	×	○	○	○	○	○	×	IC34–78 P31
CYLINDER MOTOR (DRUM MOTOR)	○	○	×	○	○	○	○	○	○	×	IC34–1 P34
PINCH SOLENOID	×	×	×	○	○	×	○	○	○	×	IC27–37 P24

○ : OPERATING
× : STOP

Fig. 3–15 Mechanical Operation by Mode

Mechanical Sensor
Location of the sensors are shown below.

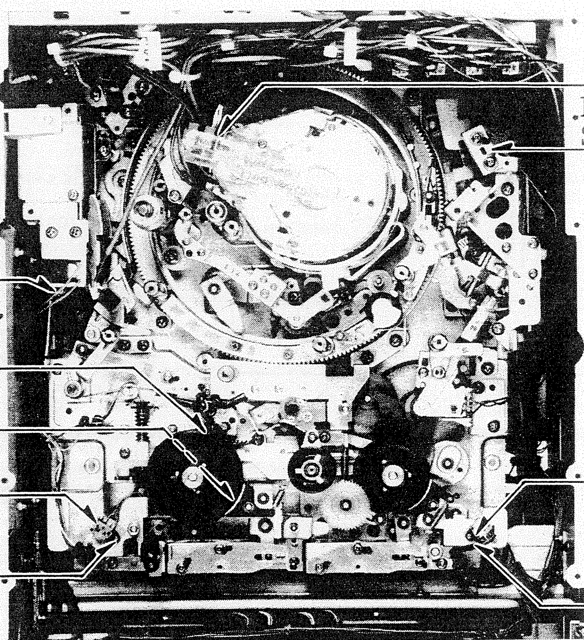


Fig. A

Fig. 3–16 Mechanical Sensor

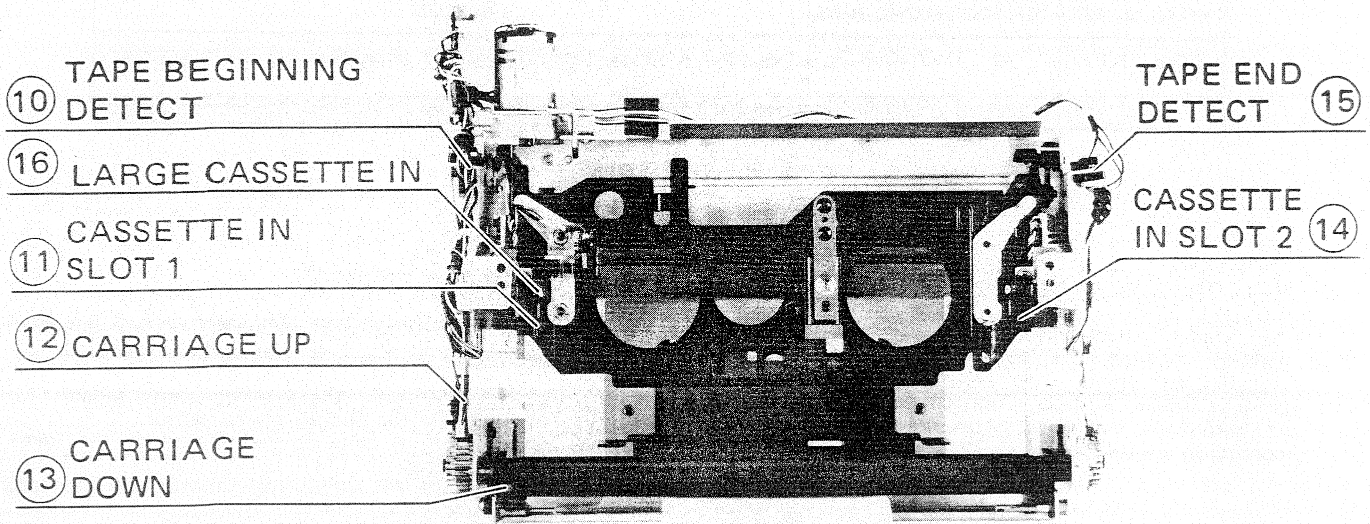


Fig. B

Fig. 3-17 Mechanical Sensor

IC NO.	BIT	PIN NO.	SIGNAL NAME	SENSOR	CONTENT
IC69	P00	28	L CASSETTE Ⓛ	16	Low when large cassette is inserted.
	P01	27	SMALL REEL UP SW	8	Low when small cassette reel base is up.
	P02	26	SMALL REEL DOWN SW	9	Low when small cassette reel base is down.
	P03	25	DETECT 1	1	Low when metal tape is inserted.
	P04	23	DETECT 2	3	Not used.
	P05	22	DETECT 3	4	Not used.
IC27	P00	28	CASSETTE UP Ⓛ	12	Low when carriage is up.
	P01	27	CASSETTE DOWN Ⓛ	13	Low when carriage is down.
	P02	26	CASSETTE IN 1 Ⓛ and	14	Low when cassette is in slot. } NAND GATE
			CASSETTE IN 2 Ⓛ	11	Low when cassette is in slot.
	P03	25	LOADING START 1 Ⓛ	5	Low when loading is started.
	P04	23	LOADING COMPLETE	7	Low when loading is completed.
	P05	22	+5V		Not used.
	P06	21	SUPPLY PHOTO	15	Low when end of tape is detected.
	P07	20	TAKE UP PHOTO	10	Low when beginning of tape is detected.
IC35	P16	50	ERASE PREVENTION SWITCH	2	Low when tape that can be recorded on is inserted.

Fig. 3-18 Mechanical Sensor I/O Port

IC NO.	BIT	PIN NO.	SIGNAL NAME	CONTENT
IC69	P22	40	Y DO PLS	**Low when Y RF is interrupted for more than one-half a frame.**
	P23	43	C DO PLS	**Low when C RF is interrupted for more than one-half a frame.**

Fig. 3-19 Head Clog I/O Port

3-9. DROP OUT DETECTION CIRCUIT

The head clog detection circuit detects the drop out of Y and C RF signals, and if the signals are missing for more than one-half a frame, it outputs a low level signal. This output goes to IC49. If it remains low for more than 2 seconds, a clog condition is indicated.

3-10. SAFETY DEVICES

The AU-630 studio VTR includes 7 safety devices. The following is a list of the items monitored.

1. Tape beginning by the take-up photo sensor
2. Tape end by the supply photo sensor
3. Temperature of take-up reel motor by the take-up thermistor
4. Temperature of supply reel motor by the supply thermistor
5. Humidity inside the machine by the dew sensor
6. Sensor led failure
7. Drum motor lock

The sensor circuits are shown in the simplified circuit diagram of figure 3-20.

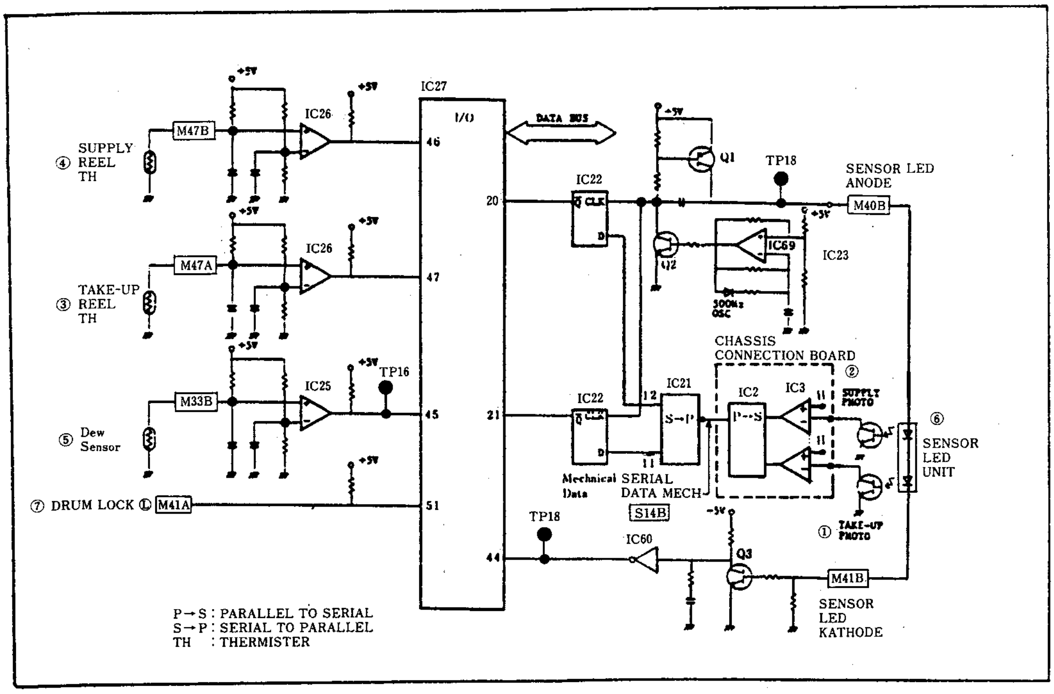


Fig. 3-20 Safety Device Circuit

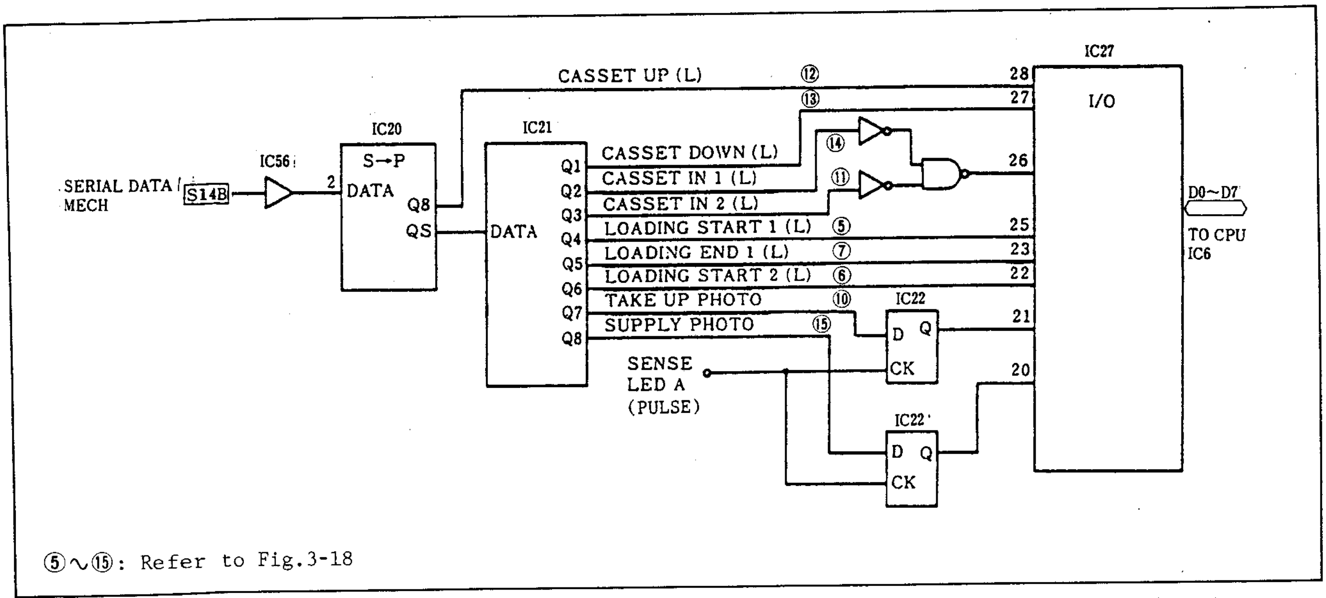


Fig. 3-21 Mechanical Select Signal

3-10-1. TAKE-UP AND SUPPLY SENSORS

Refer to Fig. 3-20.
Two optical sensors are provided to detect the beginning and end of the tape. An infrared LED that is a sensor LED unit is used to supply illumination to the photo transistors.
This LED is driven by oscillator IC23 through Q1 and Q2. The output of this oscillator is also sent to the clock inputs of D type flip-flop IC22 which is used to latch the photo transistor data only when the LED is on.
The photo transistors are wired to the negative inputs of voltage comparator IC3 on the chassis connection board. The positive inputs are fixed by the resistive divider.
When the photo transistors are off (dark), the negative inputs of IC3 will be higher than the positive inputs. This will make the outputs low. This low will be sent to I/O IC27 through IC21 and IC22.
When the tape leader is detected, the photo transistor will turn on. This will make the negative input of IC3 lower than the positive input. A high output will be produced which will be sent to I/O IC27 through IC21 and IC22.

3-10-2. REEL MOTOR TEMPERATURE SENSORS

Refer to Fig. 3-20.
The temperature of the reel motors is monitored by a thermistor located inside the motor. The characteristics of the thermistor cause its resistance to decrease as the temperature increases. The detector circuit uses a voltage comparator with its negative input set to a reference voltage and the thermistor connected to the positive input.
The outputs of IC26 are normally high. When the temperature of the motors increases to about 194~212 degrees F or 90 ~ 100 degrees C, the decrease in thermistor resistance causes the positive input to become lower than the negative input. IC26 output will now go low. The CPU will read this low through IC27-pin 45, or pin47 and turn the unit off.

3-10-3. DEW SENSOR

Refer to Fig. 3-20.
The DEW sensor measures the humidity level inside the VCR in order to prevent tape damage from occurring.
When humidity increases, the resistance of the sensor increases. This sensor is connected to the negative input of IC25.
The positive input is set to a reference voltage. When the humidity level is less than 90%, the sensors resistance is low enough to make IC25 output high. If humidity increases to more than 90%, the resistance will increase causing the negative input of IC25 to become higher than the positive input, when this occurs the output will become low. This low is input to pin 51 of IC27.
The system control will place the VCR into the STOP mode.

3-10-4. SENSOR LED FAILURE

Refer to Fig. 3-20.
If the sensor LED were to fail, the tape would be damaged if the VCR was in the FF or REW mode and the end of tape was reached. (Because of no end of tape indication)
To prevent this, Q3 and IC60 make up a circuit which monitors current flow through the LED. In normal operation Q3 base receives the LED's drive pulses and is switched on and off. A filter in the collector circuit of Q3 removes the pulses and presents a steady low to the input of inverter IC60. A high output from IC60 is sent to pin 44 of IC27.
If the LED or drive circuit were to fail, Q3 base will go low causing the collector to go high which when passed through IC60 would present a low to pin 44 of IC27. The machine would now be placed into the STOP mode by system control.

3-10-5. DRUM MOTOR LOCK

If the drum motor fails to rotate because of a mechanical jam, servo, or motor failure a low signal will be sent from the servo board to pin 51 of IC27. The system control will stop and turn off the VCR.

3-11. ERROR MESSAGE

The error messages that indicate abnormal conditions in the VCR are decided based on the following conditions and displayed on the front panel by using 0~9 and A~F code.

> SERVO NOT LOCKED --- "E-00"
Capstan servo, drum servo, and/or frame servo are unlocked for more than 3 sec, in REC, EDIT and PLAY mode.
VTR mode is continued.

> DRUM MOTOR --- "E-10"
Drum rotation does not begin within 5 sec.
VTR mode will go to stop mode.

> REEL MOTOR --- "E-11"
Take-up reel does not rotate while a maximum of 10 cm of tape is advanced.
VTR mode will go to stop mode.

> S REEL OVER HEAT --- "E-12"
Supply reel motor temperature is in the range of 90 ~ 100 degrees C or 194 ~212 degrees F.
VTR mode will go to stop mode.

> T REEL OVER HEAT --- "E-13"
Take-up reel motor temperature is in the range of 90 ~ 100 degrees C or 194 ~212 degrees F.
VTR mode will go to stop mode.

> FRONT LOAD MOTOR --- "E-14"
Cassette does not move down within 5 sec. after tape insertion.
VTR mode will go to eject mode.

> LOADING MOTOR --- "E-15"
Tape loading or unloading is not completed within 10 sec.
VTR mode will go to stop mode.

> PHOTO TRANSISTOR --- "E-16"
Sensor LED is not functioning.
VTR mode will go to stop mode.

> DEW --- "E-17"
Moisture is present in the machine.
VTR mode will go to stop mode.

> TAPE SLACK --- "E-18"
Tape slack or improper winding is occurring. VTR mode will go to stop mode.

> LOW RF --- "E-01"
The video head are clogged.
VTR mode will be continued.

> REEL DRIVE ERROR --- "E-19"
The actual tape operation is different from the selected mode, during high speed travel of the tape.
VTR mode will be continued.

> FAN STOP --- "E-1F"
When the fan for power supply circuit is stop, the message is flashing.

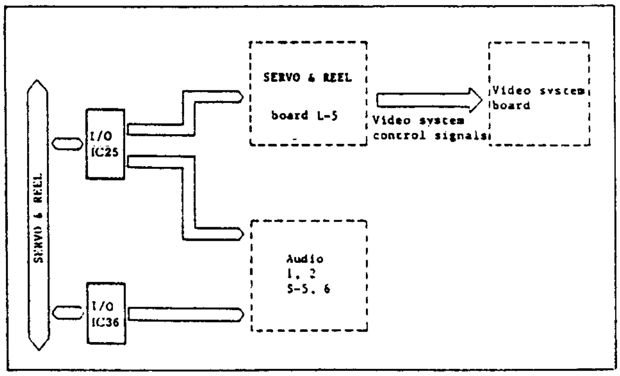


Fig. 3-22 Video/Audio System Control

> DC POWER TROUBLE
If +12V voltage of S circuit (S0 ~S10) has lowered, "E-1A" is displayed.
DC +12V --- "E-1B"
DC +24V --- "E-1C"
DC -5V --- "E-1d"
DC -12V --- "E-1E"

The control outputs produced by IC's 25, 36, and 60 are listed in the following chart.

Note: Signal names are noted as port outputs.

	IC NO.	PIN NO.	SIGNAL NAME	CONTENT	
Video system	IC34	61	REC (H)	REC mode start signal	*N
		60	EDIT START (H)	EDIT mode start signal	*N
		59	MOD ON (H)	Video system FM modulation ON/OFF signal	*N
		58	EDIT (H)	AUTO H circuit ON/OFF circuit	*N
		57	EE MODE (H)	Video system E-E mode	*N
		56	ADV1 (H)	Advance mode request signal	
		55	ADV2 (H)	Advance mode request signal	
	IC35	69	SEARCH (H)	Search mode start signal	
Audio system	IC35	77	CH1 EE (H)	CH1 EE mode request signal	*N
		78	CH2 EE (H)	CH2 EE mode request signal	*N
		79	TC ERASE (H)	Time code erase request signal	*N
		80	CH1 R/P (H)	CH1 REC mode start signal	*N
		1	CH2 R/P (H)	CH2 REC mode start signal	*N
		2	TC R/P (H)	Time code REC mode start signal	*N
		3	FULL ERASE (H)	Full erase start signal	*N
		4	SOURCE (H)	Simultaneous playback mode start signal	*N
		60	FM MUT (H)	FM audio muting request signal	*N
	IC34	4	CTL REC (H)	CTL REC mode start signal	*N
	IC68	43	CH1 ERASE (H)	CH1 erase request signal	*N
		37	CH2 ERASE (H)	CH2 erase request signal	*N
		36	OSC ON (H)	Audio master oscillator oscillation request signal	*N
		35	LOADING MUT (H)	During loading muting request signal	

Fig. 3–23 Video/Audio Control I/O Port

*N: REC, EDIT and ERASE functions are not used in this VTR.

3-12. CONTROL SIGNAL TIMING BY MODE

Timing of control signals by mode is shown below. Only CH1 is shown for audio, but CH2 takes the same timing.

3-12-1. REC PLAY MODE *N

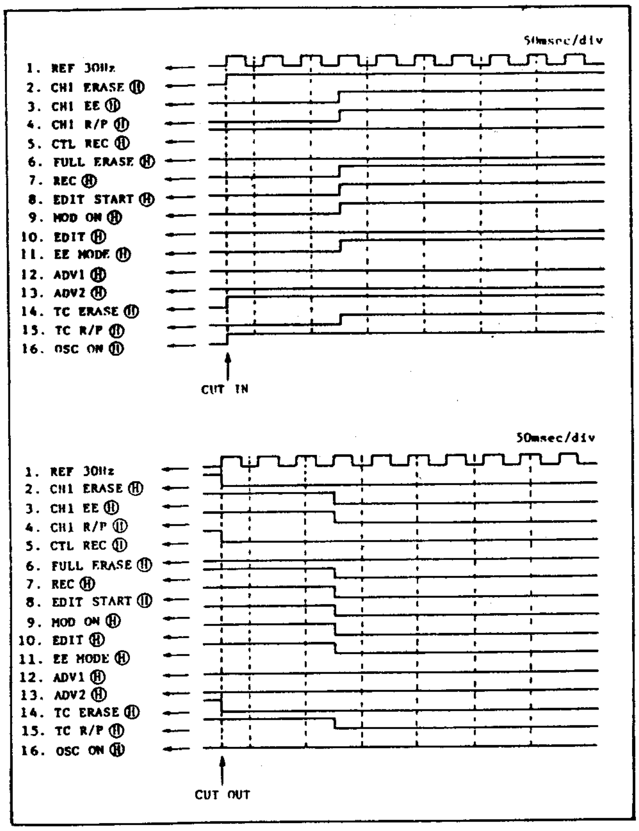


Fig. 3-24 Rec/Play mode Timing Chart

At record/play start, the following signals go high: the video system recording control signals REC(H) and MOD ON (H), FULL and the audio system erase request signals CH1 ERASE (H),ERASE (H), CTL REC (H), TC ERASE (H) and OSC ON (H). Recording of video and CTL and full erase begins. About 3 frames later, the audio system record control signals CH1 EE (H), CH1 R/P (H) and TC R/P (H) go high and recording of audio and time code begins.

3-12-2. REC PLAY OUT MODE *N

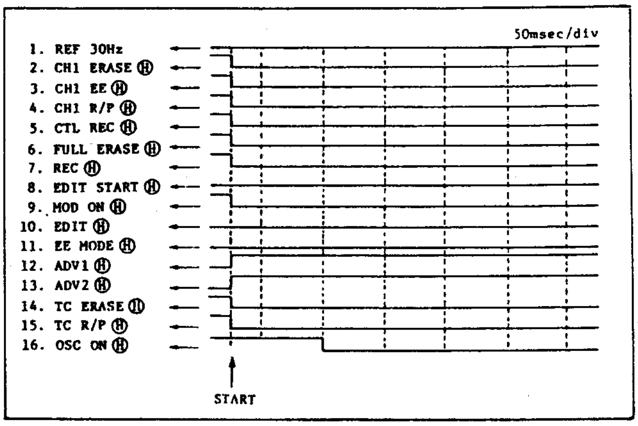


Fig. 3-25 Rec/Play Out Timing Chart

At the same time as REC PLAY OUT, control signals for the video and audio system go low, but only the master oscillator control signal OSC ON (H) stops about 800msec later.

3-12-3. REVIEW MODE (ASSY VIDEO, AUDIO CH1,TC)

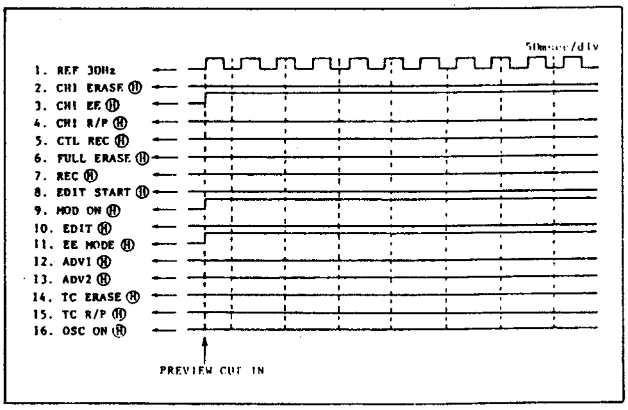


Fig. 3-26 Preview Mode Timing Chart

At PREVIEW (ASSY VIDEO, AUDIO CH1,TC) start, EDIT (H) goes high, the AUTO H circuit operates, and the video and audio systems are set to the E-E system at the cut-in point, and therefore CH1 EE (H), MOD ON (H) and EE MODE (H) are set to HIGH.

3-12-4. PREVIEW OFF MODE
(ASSY VIDEO, AUDIO CH1, TC)

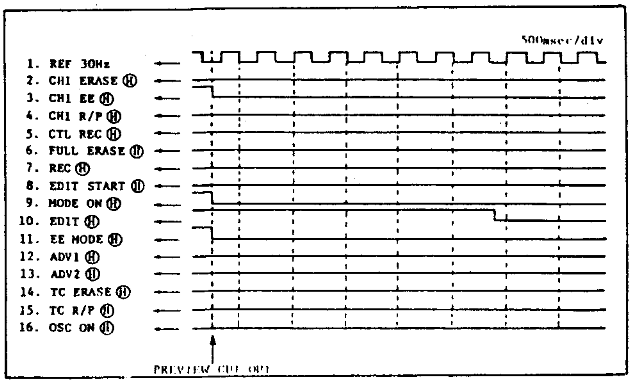


Fig. 3-27 Preview OFF Mode Timing Chart

At PREVIEW (ASSY VIDEO, AUDIO CH1, TC) cut out, the video/audio system E-E mode request signals CH1 EE (H), MOD ON(H) and EE MODE (H) go low at the cut out point.

3-12-5. INSERT MODE (VIDEO, AUDIO CH1, TC) *N

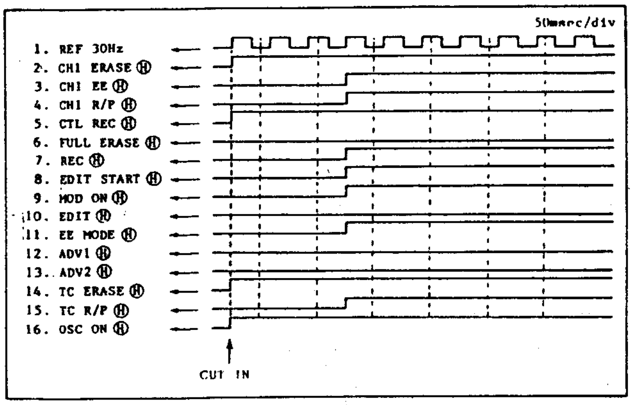


Fig. 3-28 Insert Mode Timing Chart

It INSERT (VIDEO, AUDIO CH1, TC) start, EDIT (H) goes high, the AUTO H circuit starts and CH1 ERASE (H), TC ERASE (H) and OSC ON (H) go high at the cut in point to start erasing etc. About 3 frames later, CH1 EE (H), CH1 R/P (H), EDIT START (H), MOD ON (H), EE MODE (H) and TC R/P (H) go high to start recording.

3-12-6. INSERT OFF MODE *N
(VIDEO, AUDIO CH1, TC)

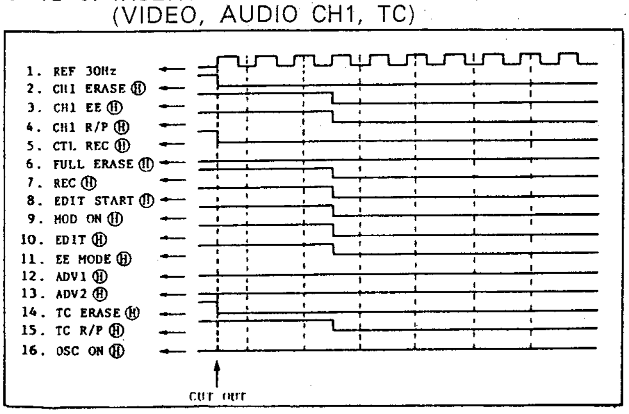


Fig. 3-29 Insert OFF Mode Timing Chart

*N: REC, EDIT and ERASE functions are not used in this VTR.

At INSERT (VIDEO, AUDIO CH1, TC) cut out the erase controls signal CH1 ERASE (H) and TC ERASE (H) go low at the cut out point, erasing stops and for an interval of about 3 frames, video,audio and TC are overlaid. About 800msec later OSC ON (H) goes low.

3-12-7. ASSEMBLE MODE (VIDEO, AUDIO CH1, TC) *N

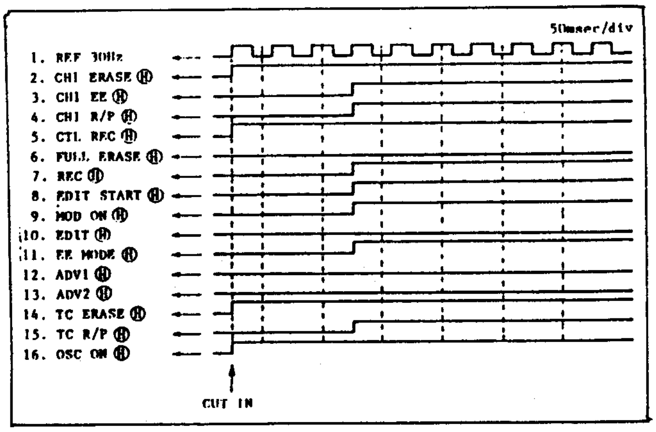


Fig. 3-30 Assemble Mode Timing Chart

At ASSEMBLE (VIDEO, AUDIO CH1, TC) start, EDIT (H) is on and the AUTO H PHASE circuit starts, and the erase system control signals CH1 ERASE (H), TC ERASE (H) and OSC ON (H) go high at the cut in point. In the ASSEMBLE mode, CTL REC (H), REC (H), EDIT START (H), MODE ON (H), EE MODE (H) and TC R/P (H) go high to start video/audio system recording.

3-12-8. ASSEMBLE OFF MODE (VIDEO, AUDIO CH1, TC)

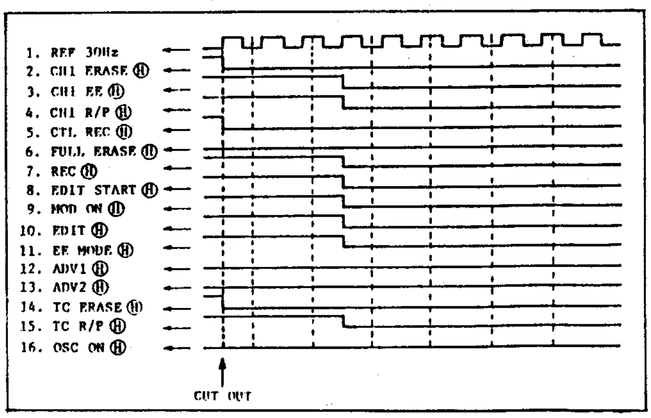


Fig. 3-31 Assemble OFF Mode Timing Chart

At ASSEMBLE (VIDEO, AUDIO CH1, TC) cut out, the erase control signals CH1 ERASE (H), TC ERASE (H) and CTL ERASE (H) go low at the cut out point. Overlaying is done for about 3 frames, and about 800msec later OSC ON (H) goes low.

3–13. SEARCH DIAL

The search dial is used to select the desired tape playback speed and direction. Playback can be varied from 1/32 to 32X normal speed, forward or reverse. In addition, a jog mode allows the tape to be viewed frame by frame by rotating the dial.

The search dial is constructed of a slotted disk and two photo transistors. The photo transistors are position so that as the disk rotates two 90 degrees shifted square wave output signals are produced. These two signals S 0 and S 1 are then sent to the search dial encoder circuit Where speed and direction are determined.

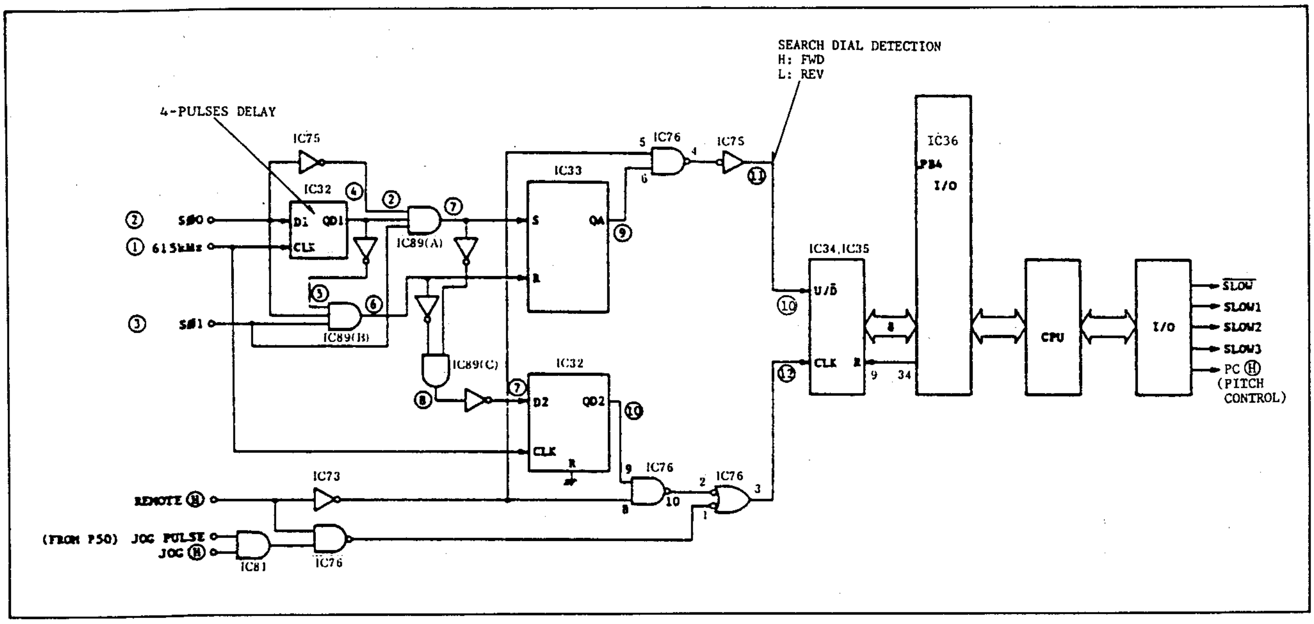


Fig. 3–32 Search Dial Schematic Diagram

DISPLAY	0	1/32	2/32	3/32	4/32	5/32	6	7	8/32	9/32	10	11	12	13	14	15	16/32	18/32	20	22	24	26	28	30	32/32	36/32	40	44	48	52	56	60	64/32
MODE	STILL	x1/32	x1/16	x 1/8		x 1/4				x 1/2								x 1								x 2							
PC Ⓗ	H	H	H	L	H	L	L	L	H	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H
SLOW 3	L	L	L	H	L	L	H	H	L	L	L	L	H	H	H	H	L	L	L	L	H	H	H	H	L	L	L	L	H	H	H	H	L
SLOW 2	L	L	L	L	L	H	L	H	L	L	H	H	L	L	H	H	L	L	H	H	L	L	H	H	L	L	H	H	L	L	H	H	L
SLOW 1	L	L	L	L	L	L	L	L	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
$\overline{SLOW}$	H	L																															L
COUNTER NUMBER	0	1.2	3.4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34→

Fig. 3–33 Variable Slow Mode

DISPLAY	0	1/32	1/16	1/8	1/4	1/2	1	2	4	8	32
MODE	STILL	x 1/32	x 1/16	x 1/8	x 1/4	x 1/2	x 1	x 2	x 4	x 8	x 32
PC Ⓗ	H										H
SLOW 3	L	←								→	L
SLOW 2	L										L
SLOW 1	L										L
$\overline{SLOW}$	H ←										→ H
COUNTER NUMBER	0	1 - 4	5 - 8	9 - 12	13 - 16	17 - 20	21 - 24	25 - 28	29 - 35	36, 37	38 -

Fig. 3–34 Shuttle Mode

DISPLAY	0	1/32	1/16	1/8	1/4	1/2	1	2
MODE PC(H) SLOW SLOW 3-1	SAME AS SHUTTLE MODE							
COUNTER NUMBER	0, 1	2 - 4	5 - 7	8 - 15	16 - 29	30 - 44	45 - 60	61 -

Fig. 3-35 Jog Mode

3-13-1. COUNT UP MODE

Refer to figure 3-32.
The phase of the search dials S0 FG signal (2) is advanced 90 degrees from the S1 FG signal 3 when the dial is rotated in the clockwise direction.
S0 FG signal (2) is sent to the "D"input of IC32 which is a shift register. A 615 kHz clock signal is used to clock the input of IC32.
The output signal (4) of IC32 is delayed 4 clock pulses from the rising edge of the "D" input signal, and sent to IC55 (A) and IC55 (B) through inverter IC40 ((5) signal).
Signal (7) is produced by "AND circuit" IC55 (A) from the (2), (3) and (4) signals, and sent to the "S" input of IC33.
Signal (6) is produced by "AND circuit" IC55 (B) from the (5), (2) and (3) signals. Signal (6) is a low signal, and is sent to the "R" input of IC33.
Signal (9) is produced by RS type flip-flop IC33 from the (6) and (7) signals. The (6) signal is now low, therefore output signal (9) is changed low to high by the first rising edge of signal (7).
The (OA) output signal (9) of IC33 is sent to the "up/down" input of IC35 through AND gate IC56 and inverter IC42. This direction indication signal is also sent to the system control CPU through port PB4 of IC34. It is used to determine in what direction to move the tape.
Clockwise direction is high and counterclockwise direction is low.

IC32 output signal (10) is delayed 4 clock pulses from the rising edge of signal (7) and sent to the clock input of IC's 12 and 22 through IC76.
Signal (12) is counted by counters (IC34 and IC22), and the data produced is sent to the system control CPU through I/O port IC35.
The CPU controls the VCR's speed mode using this count number.
When the search dial is returned to the center position the counters are reset by the CPU.

3-13-2. COUNT DOWN MODE

When the search dial is rotated in the counterclockwise direction, the phase of the S1 FG signal (3) is advanced 90 degrees from the S0 FG signal (2).
Signal (7) at the "S" input of IC33 is low and the rising edge of signal (6) at the "R" input of IC33 causes the output signal (9) to be changed from a high to a low.
The "up/down" inputs of ICs 34 and 35 are now low, indicating the down count mode.
The counter value is read by the CPU and the REV speed mode is now determined.

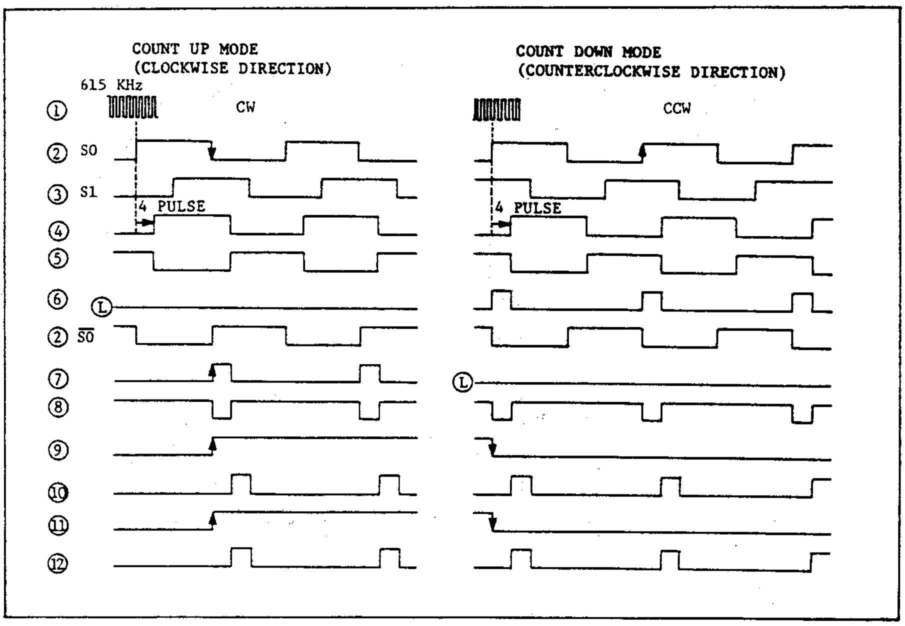


Fig. 3-36 Search Dial Timing Chart

3-13-3. JOG MODE

In the JOG mode, up/down pulse counting is done the same as in the other modes. But the CPU also needs information indicating how fast the JOG dial is being turned. Speed information is obtained by reading and reseting the counters at a fixed rate. The number of counts accumulated during one cycle time period is a indication of the dials speed.
A chart showing the counters value for each of the speed modes is shown in figure 3-26.

3-13-4. REMOTE MODE

When the remote 1 or remote 2 mode is set by the control switch located on the front of deck, a remote low signal is applied to pin 5 and pin 8 of IC76. This will inhibit the internal search dials signals from reaching counters IC34 and 35. At this time the speed mode is controlled by signals through the remote connector.
In the JOG mode of remote 1, the JOG pulses are applied to the clock input of IC34 and 35 through IC29, 45 and 76. These counters then count the remote JOG pulses from the 50 pin parallel interface.
In the remote mode, the count up/down detect input is always held low and the direction signal is sent to the CPU from the remote controller.

3-14. SYSTEM CONTROL INTERFACES

Several interfaces are include on the system control board to allow communication between boards and with external devices. A parallel interface (50-pin remote connector) and a serial interface (9-pin serial remote) are available for external devices. (Remote control, editing controller, etc.)
Fig. 3-37 shows the 50-pin and 9-pin system control interface connectors.

4 Remote 2 Connector (loop-thru, 9P)
This unit can be remotely controlled by the serial data (RS-422A).
Set the front Control Switch to "REMOTE" and the REMOTE Switch on the front sub-panel to "2 (9P)" when using this function.

3 Remote 1 Connector (50P)
This is the parallel remote connector.
Set the front Control Switch to "REMOTE" and the REMOTE Switch on the front sub-panel to "1 (50P)" when using this function.

4-3. Rear Panel

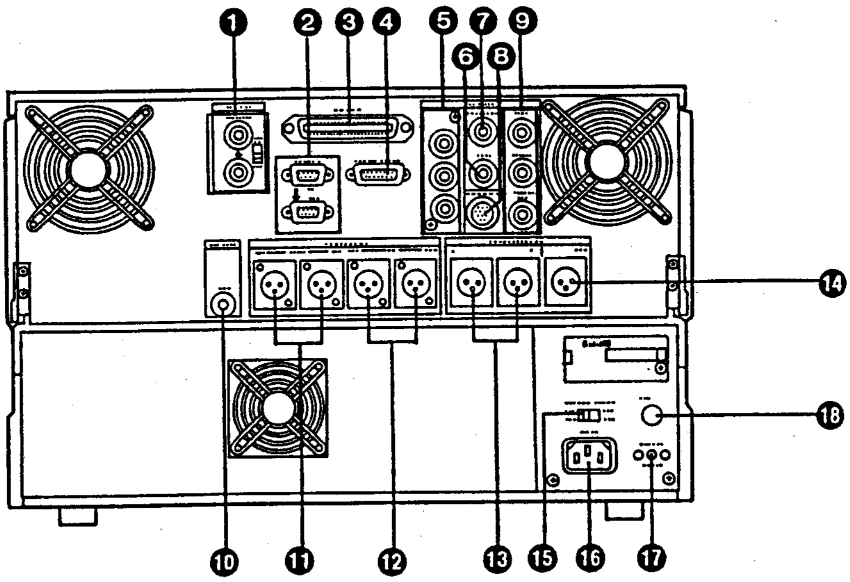
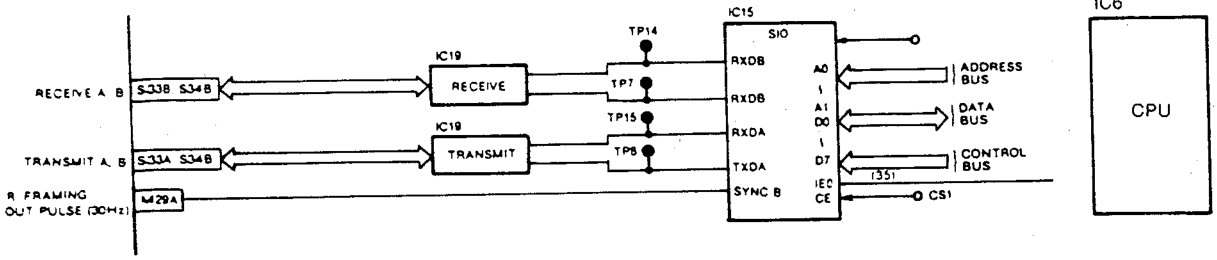
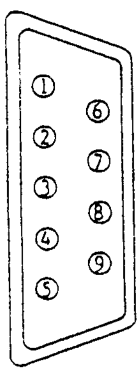


Fig. 3-37 System Control Interface Connector

The pin assignments for the 9-pin Remote 2 connector is shown in Fig. 3-38.
The pin assignments for the CONTROLLING DEVICE and the CONTROLLED DEVICE are selected by the control switch "LOCAL or REMOTE" which is located on the front pull-out drawer.



LOCAL REMOTE



(OUTSIDE VIEW)

PIN	CONTROLLING DEVICE	CONTROLLED DEVICE
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground

Fig. 3-38 9-pin Remote Control

9PIN CONNECTOR ⇔

REMOCOM MAIN BOARD

P361	
1	GND
2	RECEIVE B
3	TRANSMIT B
4	GND
5	RECEIVE A
6	TRANSMIT A
7	SPACE 1
8	SPACE 2

L MOTHER

P24		TO
1	GND	L6S-32
2	RECEIVE B	L6S-34B
3	TRANSMIT B	L6S-34A
4	GND	L6S-32
5	RECEIVE A	L6S-33B
6	TRANSMIT A	L6S-33A
7	SPACE 1	
8	SPACE 2	

Fig. 3-39 9-pin signal Flow

The pin assignments for the 50-pin Remote 1 connector is shown in Fig. 3-39.

PIN NO.	SIGNAL NAME	IN-OUT FOR DECK	EXPLAMATION	
1	$\overline{\text{REC}}$ COMMAND	IN	Becomes low as when REC button of VCR is pressed.	✱N
2	$\overline{\text{PLAY}}$ COMMAND	IN	Becomes low as when PLAY button of VCR is pressed.	
3	$\overline{\text{FF}}$ COMMAND	IN	Becomes low as when FF button of VCR is pressed.	
4	$\overline{\text{REW}}$ COMMAND	IN	Becomes low as when REW button of VCR is pressed.	
5	$\overline{\text{STOP}}$ COMMAND	IN	Becomes low as when STOP button of VCR is pressed.	
6	$\overline{\text{PAUSE}}$ COMMAND	IN	Becomes low when pause button pressed.	
7	$\overline{\text{CUT IN}}$ COMMAND	IN	Becomes low as when CUT IN button of VCR is pressed.	✱N
8	$\overline{\text{CUT OUT}}$ COMMAND	IN	Becomes low as when CUT OUT button of VCR is pressed.	✱N
9	$\overline{\text{AUDIO CH1}}$ COMMAND	IN	Becomes low as when AUDIO CH1 INSERT button of VCR is pressed.	✱N
10	$\overline{\text{AUDIO CH2}}$ COMMAND	IN	Becomes low as when AUDIO CH2 INSERT button of VCR is pressed.	✱N
11	$\overline{\text{VIDEO}}$ COMMAND	IN	Becomes low as when VIDEO INSERT button of VCR is pressed.	✱N
12	$\overline{\text{TC}}$ COMMAND	IN	Becomes low as when TC INSERT button of VCR is pressed.	✱N
13	$\overline{\text{SHTL}}$ COMMAND	IN	Becomes low as when SEARCH button of VCR is pressed.	
14	$\overline{\text{JOG}}$ COMMAND	IN	Becomes low as when JOG button of VCR is pressed.	
15	$\overline{\text{PREROLL}}$ COMMAND	IN	Becomes high as when PREROLL button of VCR is pressed.	
16	$\overline{\text{EDIT}}$ COMMAND	IN	Becomes low as when EDIT button of VCR is pressed.	✱N
17	SEARCH 0	IN	SEARCH MODE COMMAND P search mode commands	
18	SEARCH 1	IN		
19	SEARCH 2	IN		
20	STAND BY ON/OFF COMMAND	——	Becomes high as when READY button of VCR is pressed.	
21	———————	——	———————	
22	FWD/$\overline{\text{REV}}$ COMMAND	IN	Determines tape direction in search mode FWD : HIGH. REV : LOW	
23	$\overline{\text{EJECT}}$ COMMAND	IN	Becomes low as when EJECT button is pressed.	
24	$\overline{\text{UN TH READ}}$	OUT	Becomes low when EJECT is completed.	
25	$\overline{\text{LOCAL EN}}$	——	Permits local operation during remote status.	
26	+12V	OUT	———————	

Fig. 3-39-1 50-pin Assignment

PIN NO.	SIGNAL NAME	IN-OUT FOR DECK	EXPLAMATION	
27	$\overline{\text{REC}}$ STATUS	OUT	Low in REC mode	✱N
28	$\overline{\text{PLAY}}$ STATUS	OUT	PLAY	
29	$\overline{\text{FF}}$ STATUS	OUT	Low FF mode	
30	$\overline{\text{REW}}$ STATUS	OUT	REW	
31	$\overline{\text{STOP}}$ STATUS	OUT	STOP	
32	$\overline{\text{PAUSE}}$ STATUS	OUT	Low during pause	
33	$\overline{\text{CUT IN}}$ STATUS	OUT	Low in CUT IN mode	✱N
34	$\overline{\text{SERVO LOCK}}$	OUT	Low in servo is locked	
35	$\overline{\text{AUDIO CH1 INSERT}}$ STATUS	OUT	Low in AUDIO CH1 INSERT mode	✱N
36	$\overline{\text{AUDIO CH2 INSERT}}$ STATUS	OUT	Low in AUDIO CH2 INSERT mode	✱N
37	$\overline{\text{VIDEO INSERT}}$ STATUS	OUT	Low in VIDEO INSERT mode	✱N
38	$\overline{\text{TIME CODE INSERT}}$ STATUS	OUT	Low in TIME CODE INSERT mode	✱N
39	$\overline{\text{SHTL}}$ STATUS	OUT	Low in SEARCH mode	
40	$\overline{\text{JOG}}$ STATUS	OUT	Low in JOG mode	
41	$\overline{\text{STANDBY ON}}$ STATUS	OUT	Low in stand-by (Ready) mode	
42	$\overline{\text{REMOTE}}$ STATUS	OUT	Low when control in REMOTE status	
43	$\overline{\text{FWD}}$ STATUS	OUT	Low when tape travel is forward	
44	CTL SIGNAL	OUT	Control pulse output (+12V)	
45	GND	——	———————	
46	CAPSTAN OVERRIDE	IN	Control signal during phase modification (2.2V~8.2V)	
47	GND	——	———————	
48	JOG CONTROL SIGNAL	IN	JOG dial pulse input in JOG mode	
49	JOG CONTROL SIGNAL GND	IN	Ground for JOG control signal	
50	GND		GND	

Fig. 3-39-2 50-pin Assignment

Output terminal is used an open collector transistor, so a pull-up resistor is necessary. Input terminal is used a simple on/off switch as shown in Fig. 3-40.

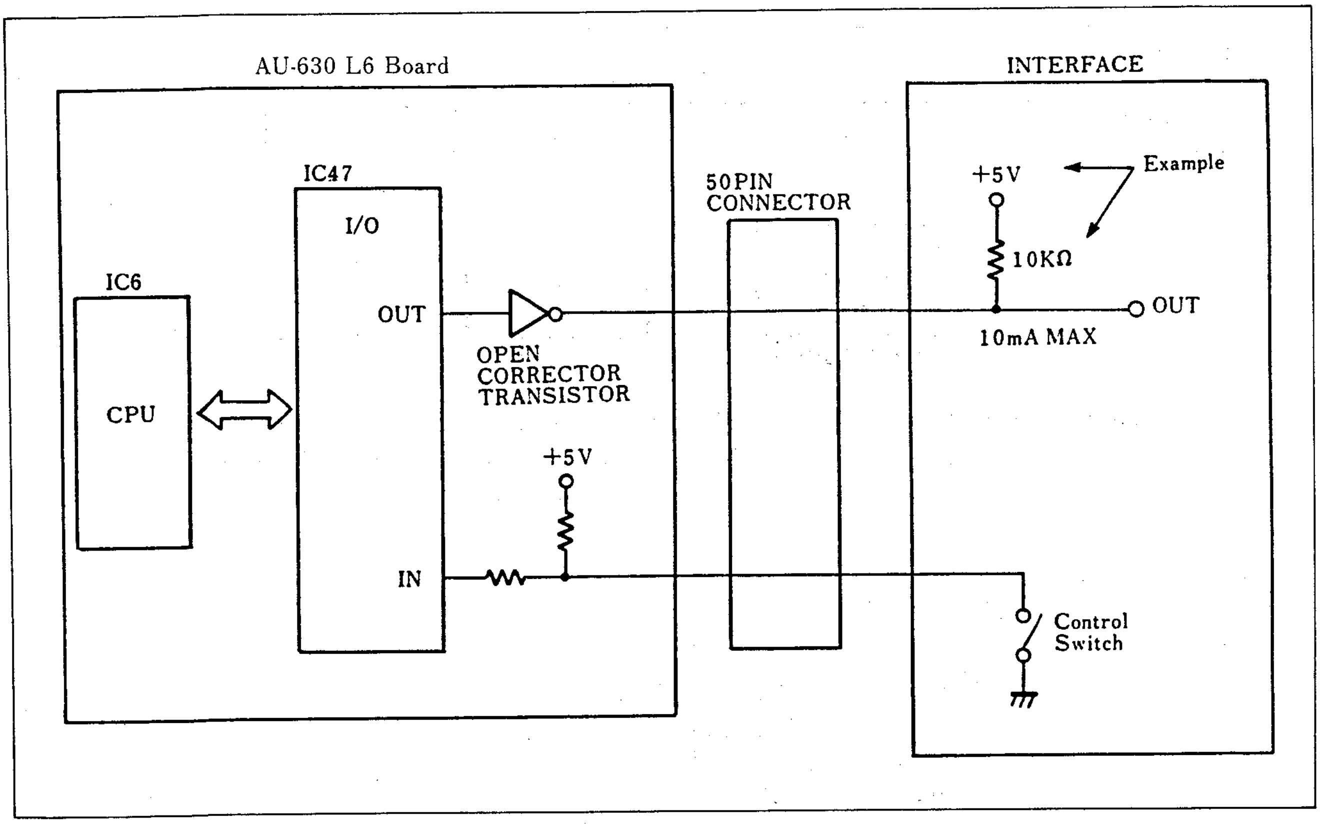


Fig. 3-40 50-pin Interface

3-14-1. SERIAL INTERFACE OF RS-422-A

(1) Communication Mode
AU-630 has two kinds of the communication modes, standard mode and SMPTE mode. Next these features are explained.

(2) Standard Mode
Standard Mode has been installed in "AU-650" and the mode is available for use of one to one communication as shown below.

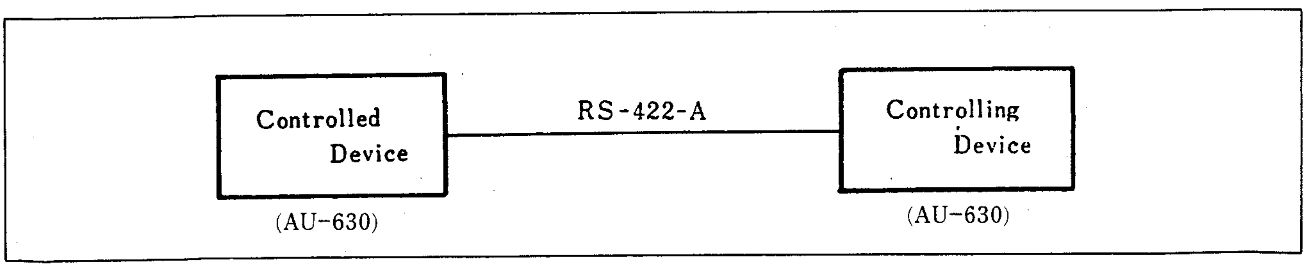
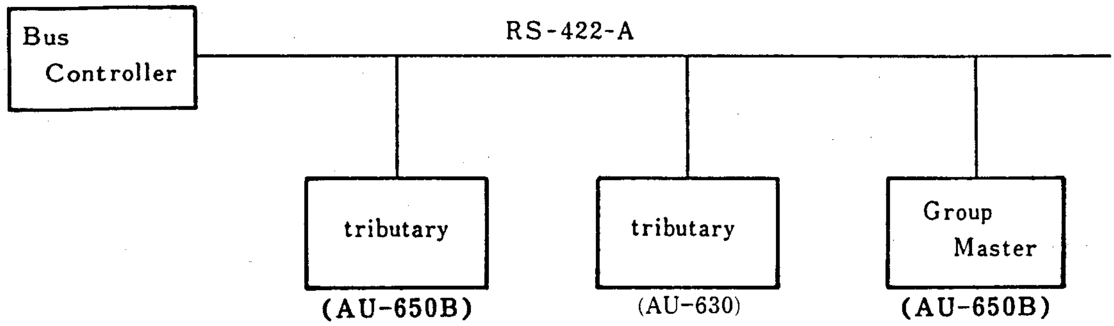


Fig. 3-41 Standard Mode Communication

(3) SMPTE Mode
SMPTE mode is newly installed on AU−650B. In this mode. AU−650B. is used as a tributary and it can be used as slave or a Group Master.
AU−630 can be used as tributary.



Selectable tributary adrress : 8280∼E8CE 256 Kinds (SW6-1∼SW6-8 on L6)
Selectable group adrress : 8080∼80F0 64 Kinds (Selected by Bus Controller)

Fig. 3−42 SMPTE Mode Communication

(4) Communication Protocol
The comparison table of the standard mode and SMPTE mode is shown in Fig. 3−43. The difference is whether odd parity (standard mode), or even parity (SMPTE mode). These modes are automatically selected by using these parity data.

Item \ Mode	Standard	SMPTE
Sync Method	Asyncronous	
Communication Speed	38.4 Kbps	
Stop bit	1	
Transmission oder	LSB First	
1 word (charadev)	8 bit	
Parsty bit	odd	even

Fig. 3−43 Communication Protocol

(5) Communication Format
The data format of the standard mode is shown in Fig. 3−44, and the data format of the SMPTE mode is shown if Fig. 3−45.

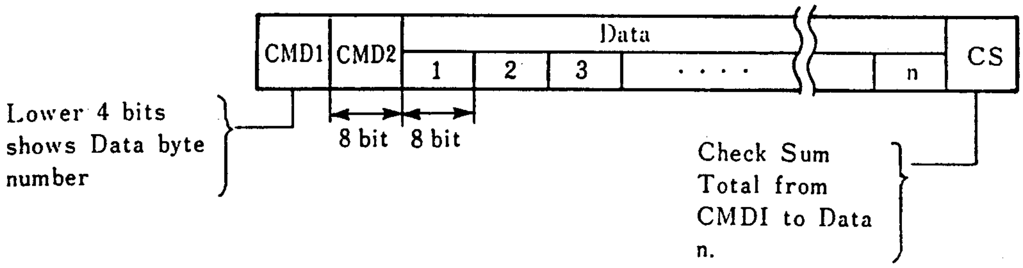


Fig. 3−44 Standard Mode Data Format

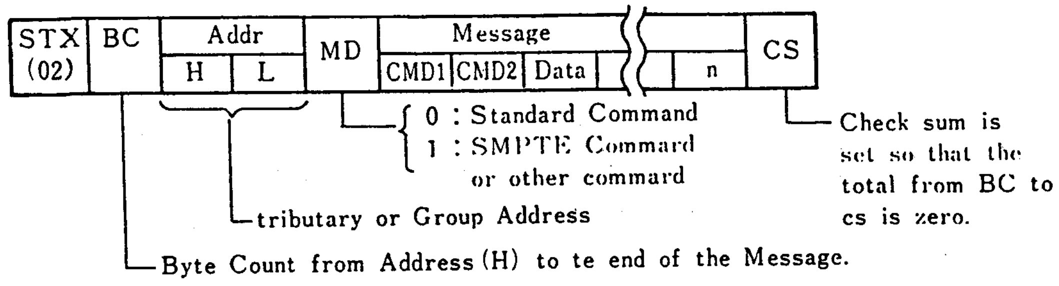


Fig. 3–45 SMPTE Mode Data Format

(6) Functions of Standard Mode

In case of the standard mode, the function is upper compatible of it of "AU–650B", and following functions are added.

1. Variable Memory Remote Control
2. Audio split Editing Remote Control
3. Remote Trouble Message Transmission
4. Capstan Override Function

(7) Functions of SMPTE Mode
In case of the SMPTE mode, the following functions are added on "AU–650B".
(A) Grouping Function
AU–650B.or AU–630 can belong in the maximum 5 tributary groups. The groups of the tributary is controlled by the Bus Controller.

(B) Group Master Function
In one tributary group, only one Group Master can be defined. AU–650B.or AU–630 can be defined as a Group Master by the command from Bus Controller. The Group Master responds the command which is attentioned to the Group Master and from the Bus Controller, and System Sync command.

(C) Capstan Override Function
When AU–650B.or AU–630 is defined as tributary, capstan override function is available.
The Bus Controller transmits the System Sync command and the Group Master receives the command and sends back a Sync Time. The other tributary receives the Sync Time from the Group Master and controls the capstan override.

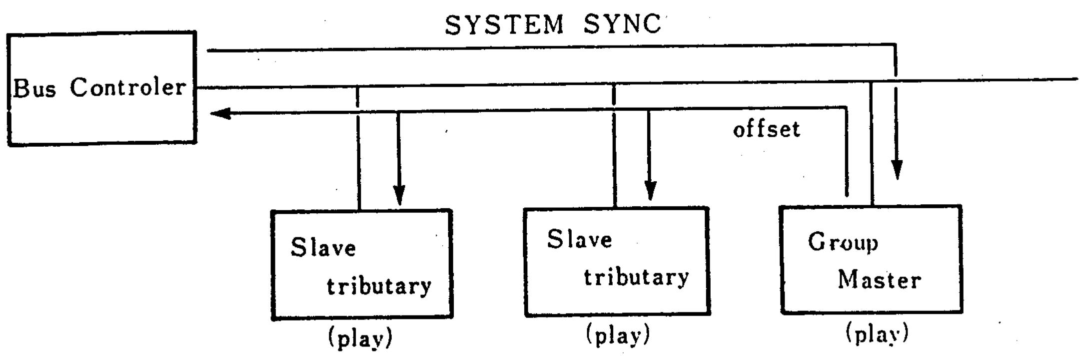


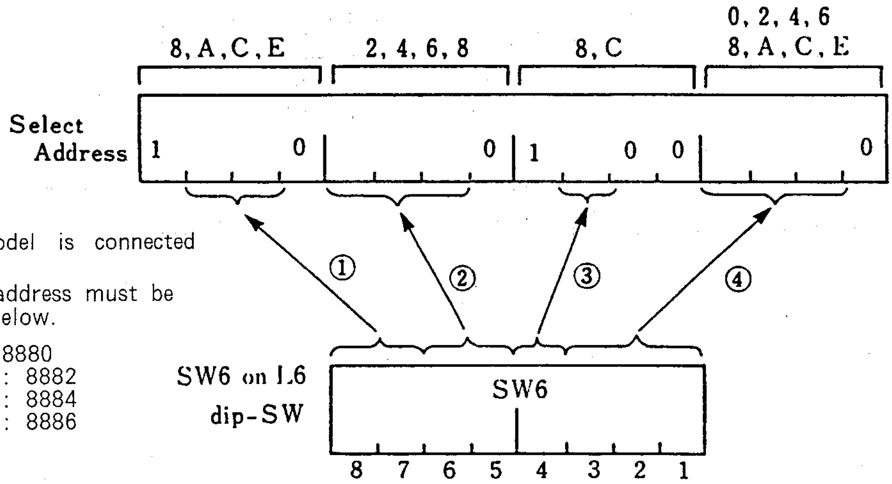
Fig. 3–46 Capstan Override Function

(8) Address Set

Tributary must have the address and all tributary must have original address to define the only one deck.
The address can be set by using one dip switch, which is located on L6 board and its reference number is SW6.

The tributary address is allowed to set from 8280 to E8CE, totally 256 kind address can be set, so 8 bit switch is enough to use for this purpose.
Refer to Fig. 3–47.
If you want to set the address at 8280, set the dip switch SW6 to "00000000". If you want to set the address at E8CE, set the dip switch SW6 to "11111111".

7. SMPTE tributary Address



When This model is connected with AU-A65.
The tributary address must be set as shown below.

Recorder (R): 8880
Player 1 (P1): 8882
Player 2 (P2): 8884
Player 3 (P3): 8886
AUX: 8888

Fig. 3-47 SMPTE Tributary Address

①

SW6-8, SW6-7	Select Address	
0 0	1 0 0 0	8
0 1	1 0 1 0	A
1 0	1 1 0 0	C
1 1	1 1 1 0	E

②

SW6-6, SW6-5	Select Address	
0 0	0 0 1 0	2
0 1	0 1 0 0	4
1 0	0 1 1 0	6
1 1	1 0 0 0	8

③

SW6-4	Select Address	
0	1 0 0 0	8
1	1 1 0 0	C

④

SW6-3, SW6-2, SW6-1	Select Address	
0 0 0	0 0 0 0	0
0 0 1	0 0 1 0	2
0 1 0	0 1 0 0	4
0 1 1	0 1 1 0	6
1 0 0	1 0 0 0	8
1 0 1	1 0 1 0	A
1 1 0	1 1 0 0	C
1 1 1	1 1 1 0	E

○ Tributary address
8280~E8CE 256kinds

○ Group address
8080~80F0 64kinds

Fig. 3-48 Address set and Dip-SW

3-15. DEFINITION OF SERIAL PROTOCOL

(1) INTERFACE SYSTEM OVERVIEW

* Based on the EIA standard RS-422-A.
* Full duplex (four-wire) communication channels
* Asynchronous, bit serial, word serial signal
* Data rate: 38.4Kbits per second (Kb/s.)
* The data words utilized by the interface system shall be as follows:

1 START Bit +8 DATA Bits + 1 PARITY Bit + 1 STOP Bit

ODD parity: (standard) The total of logic "1"s in D0, D1,...,D7 and PARITY equals an odd number.

EVEN parity: (SMPTE) The total of logic "1"s in D0, D1,...,D7 and PARITY equals an even number.

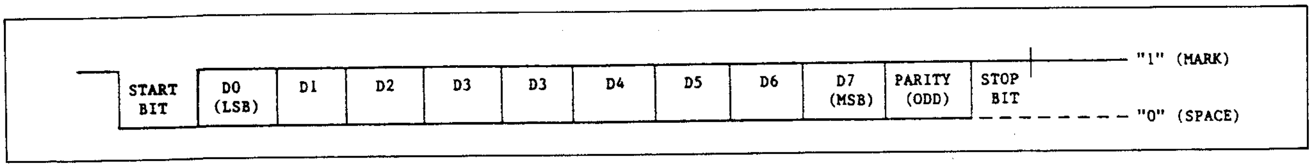
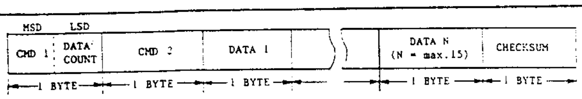


Fig. 3-49 Data Words Table

(2) COMMAND BLOCK FORMAT (CMD BLOCK)

Communication between the CONTROLLING DEVICE and the CONTROLLED DEVICE is transmitted in a PRE-DEFINED format that is composed of CMD1/DATA COUNT, CMD2 and CHECKSUM.
The number of DATA BYTES inserted between CMD2 and CHECKSUM must correspond with the DATA COUNT value.

CMD 1: Classifieds the COMMAND into the major groups, which indicates the function and direction of the COMMAND block to follow.



CMD 1	FUNCTION	DIRECTION CONTROLLING DEVICE CONTROLLED DEVICE
0	SYSTEM CONTROL	→
1	SYSTEM CONTROL RETURN	←
2	TRANSPORT CONTROL	→
4	PRESET & SELECT CONTROL	→
6	SENSE REQUEST	→
7	SENSE RETURN	←

Fig. 3-50 CMD 1 Contents

CONTENTS OF CMD 1

DATA COUNT: Indicates the number of DATA bytes when DATA is added (0 to FH) following CMD 2.
H means hexadecimal notation.

CMD 2: Designates the particular COMMAND.

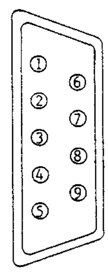
DATA: The number of DATA bytes and their contents are defined by their respective COMMANDs.

CHECKSUM: Used to detect an error in the received data block.
The CHECKSUM is the sum of the DATA (D0 to D7) contained in each DATA byte, from CMD 1 to the last DATA byte before CHECKSUM.

(3) CONNECTOR PIN ASSIGNMENTS

Interface connector : 9 pin D-subminiature female (D-9S).

The pin assignments for the CONTROLLING DEVICE and the CONTROLLED DEVICE are shown in the following table. As for the AU-630, the pin assignments are automatically switched over according to the position of the VTR (CONTROLLING DEVICE or CONTROLLED DEVICE).



(OUTSIDE VIEW)

PIN	CONTROLLING DEVICE	CONTROLLED DEVICE
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground

Fig. 3-51 9-pin Assignments

A and B are defined as follows.

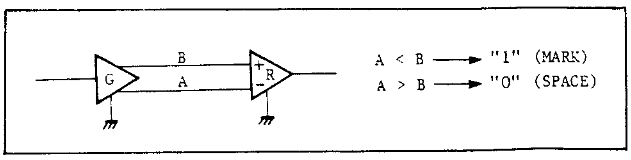


Fig. 3-52 Controlling/Controlled Device

(4) COMMUNICATION PROTOCOL

1) All communication between the CONTROLLING DEVICE and the CONTROLLED DEVICE will be under the direct supervision of the CONTROLLING DEVICE.
The AU–630 replies ACK or NAK in response to the CMD from the CONTROLLING DEVICE and transmits the CMD + DATA for the CMD which requires the DATA. If the AU–630 receives an error or a undefined CMD from the CONTROLLING DEVICE, the AU–630 will transmit NAK and the DATA which shows the cause of the error.

2) The CONTROLLING DEVICE shall not transmit the next CMD blocks to a AU–630 prior to receiving an appropriate response to a previous CMD block.

3) The CONTROLLING DEVICE shall not interrupt the transmission of a byte more than 10 msec. in a CMD block. If an interruption exceeding 10 msec, is detected during a CMD transmission, the AU–630 will transmit NAK TIME OUT, judging the received CMD block as invalid.

4) The AU–630, upon detection of an error, will immediately transmit NAK to the CONTROLLING DEVICE. The CONTROLLING DEVICE, upon receipt of NAK, shall immediately stop transmission of the CMD block. The AU–630, following transmission of NAK, will not receive a subsequent CMD block for 10 msec. (except NAK UNDEFINED), therefore the CONTROLLING DEVICE should take the necessary measures.

5) A CONTROLLED DEVICE, following receipt of a CMD block from the AU–630, shall transmit a response within 9 msec. If the AU–630 cannot receive the appropriate response from the CONTROLLED DEVICE within 10 msec. after completing. The CMD block transmission, the AU–630 will determine that proper communication cannot be done and will take the necessary measures.

5. COMMAND TABLE

* Mark (*) indicates the COMMANDS which the AU–630 dose not send out as a CONTROLLING DEVICE.

* All numerical values shown in the following table are represented by hexadecimal notation except the footnote.

Note:
The protocol commands refer to RS–422–A. No record/edit command is used with the AU–630.

COMMAND FROM CONTROLLING DEVICE				RETURN FORM VTR			
NAME	CMD1	CMD2	DATA	NAME	CMD1	CMD2	
. LOCAL DISABLE	00	0C	*1	ACK	10	01	
. DEVICE TYPE REQUEST	00	11		DEVICE TYPE DATA	12	11	
. LOCAL ENABLE	00	1D	*1	ACK	10	01	
STOP	20	00		ACK	10	01	
PLAY	20	01		ACK	10	01	
REC	20	02		ACK	10	01	
STANDBY OFF	20	04		NAK	11	12	
STANDBY ON	20	05		NAK	11	12	
. DMC START	20	0D		NAK	11	12	
FAST FORWARD	20	10		ACK	10	01	
JOG FORWARD	21	11	*3	ACK	10	01	
VAR FORWARD	21	12	*3	ACK	10	01	
SHTL FORWARD	21	13	*3	ACK	10	01	
REWIND	20	20		ACK	10	01	
JOG REVERSE	21	21	*3	ACK	10	01	
VAR REVERSE	21	22	*3	ACK	10	01	
SHTL REVERSE	21	23	*3	ACK	10	01	
PREROLL	20	30		ACK	10	01	
CUE UP WITH DATA	24	31	*4	ACK	10	01	
PROGRAM SPEED PLAY +	21	38	*5	ACK	10	01	
PROGRAM SPEED PLAY -	21	39	*5	ACK	10	01	
DMC PREROLL	20	3C	*6	NAK	11	12	
PREVIEW	20	40		NAK	11	12	
REVIEW	20	41		NAK	11	12	
AUTO EDIT	20	42		NAK	11	12	
. OUT POINT PREVIEW	20	43		NAK	11	12	
. DMC RUN	20	48	*7	NAK	11	12	
. DMC PREVIEW	20	4C	*8	NAK	11	12	
. ANTI-CLOG TIMER DISABLE	20	54	*9	ACK	10	01	
. ANTI-CLOG TIMER ENABLE	20	55	*9	ACK	10	01	

Fig. 3-53-1 Command Table

COMMAND FROM CONTROLLING DEVICE				RETURN FORM VTR			
NAME	CMD1	CMD2	DATA	NAME	CMD1	CMD2	
. DMC SET FORWARD	21	5C	*10	NAK	11	12	
. DMC SET REVERSE	21	5D	*10	NAK	11	12	
. FULL EE OFF	20	60		ACK	10	01	
. FULL EE ON	20	61		ACK	10	01	
. SELECT EE ON	20	63	*11	ACK	10	01	
EDIT OFF	20	64		ACK	10	01	
EDIT ON	20	65		ACK	10	01	
TIMER 1 PRESET	44	00	*4	ACK	10	01	
TIME CODE PRESET	44	04	*4	ACK	10	01	
USER BIT PRESET	44	05	*12	ACK	10	01	
TIMER 1 RESET	40	08		ACK	10	01	
IN ENTRY	40	10		ACK	10	01	
OUT ENTRY	40	11		ACK	10	01	
A IN ENTRY	40	12		NAK	11	12	
A OUT ENTRY	40	13		NAK	11	12	
IN DATA PRESET	44	14	*4	ACK	10	01	
OUT DATA PRESET	44	15	*4	ACK	10	01	
A IN DATA PRESET	44	16	*4	NAK	11	12	
A OUT DATA PRESET	44	17	*4	NAK	11	12	
IN + SHIFT	40	18		ACK	10	01	
IN - SHIFT	40	19		ACK	10	01	
OUT + SHIFT	40	1A		ACK	10	01	
OUT - SHIFT	40	1B		ACK	10	01	
. A IN + SHIFT	40	1C		NAK	11	12	
. A IN - SHIFT	40	1D		NAK	11	12	
. A OUT + SHIFT	40	1E		NAK	11	12	
. A OUT - SHIFT	40	1F		NAK	11	12	
IN FLAG RESET	40	20		ACK	10	01	
OUT FLAG RESET	40	21		ACK	10	01	
A IN FLAG RESET	40	22		NAK	11	12	
A OUT FLAG RESET	40	23		NAK	11	12	
IN RECALL	40	24		ACK	10	01	
OUT RECALL	40	25		ACK	10	01	
A IN RECALL	40	26		NAK	11	12	
A OUT RECALL	40	27		NAK	11	12	
LOST LOCK RESET	40	2D	*13	NAK	11	12	

Fig. 3-53-2 Command Table

COMMAND FROM CONTROLLING DEVICE				RETURN FORM VTR			
NAME	CMD1	CMD2	DATA	NAME	CMD1	CMD2	
EDIT PRESET	41	30	*14	ACK	10	01	
PREROLL TIME PRESET	44	31	*4	ACK	10	01	
TAPE/AUTO SELECT	41	32	00:AUTO 01:TAPE FF:Depends on the SW setting.	NAK	11	12	
SERVO REF SELECT	41	33	00:AUTO 01:EXTERNAL 02:INPUT FF:Depends on the SW setting.	NAK	11	12	
HEAD SELECT	41	34	00:R/P 01:PB FF:Depends on the SW setting.	ACK	10	01	
. COLOR FRAME SELECT	41	35	01:2F 02:4F 03:8F FF:Depends on the SW setting.	ACK	10	01	
. TIMER MODE SELECT	41	36	00:TC 01:TIMER 1 02:TIMER 2	ACK	10	01	
INPUT CHECK	41	37	00:OFF 01:ON	ACK	10	01	
DT FLD/FR SEL	41	38	00:FIELD MODE 01:FRAME MODE	NAK	11	12	
AUTO MODE OFF	40	40		NAK	11	12	
AUTO MODE ON	40	41		ACK	10	01	
AUTO SPLIT OFF	40	44		NAK	11	12	
AUDIO SPLIT ON	40	45		NAK	11	12	
. VAR MEM OFF	40	46		NAK	11	12	
. VAR MEM ON	40	47		NAK	11	12	
. CHAR DISPLAY 1	4X	80	*15	NAK	11	12	
. CHAR DISPLAY 2	4X	81	*15	NAK	11	12	
. CHAR DISPLAY 3	4X	82	*15	NAK	11	12	
. CHAR DISPLAY 4	4X	83	*15	NAK	11	12	
. CHAR DISPLAY 5	4X	84	*15	NAK	11	12	
. CHAR DISPLAY 6	4X	85	*15	NAK	11	12	
. CHAR DISPLAY 7	4X	86	*15	NAK	11	12	
. CHAR DISPLAY 8	4X	87	*15	NAK	11	12	
TC GEM DATA SENSE	61	0A	01:TIME	GEN TIME DATA	74	08	*4
TC GEM DATA SENSE	61	0A	10:UB	GEN UB DATA	74	09	*12
CURRENT TIME SENSE	61	0C	01:LTC	LTC TIME DATA	74	04	*4
CURRENT TIME SENSE	61	0C	02:VITC	VITC TIME DATA	74	06	*4

Fig. 3–53–3 Command Table

COMMAND FROM CONTROLLING DEVICE				RETURN FORM VTR			
NAME	**CMD1**	**CMD2**	**DATA**	**NAME**	**CMD1**	**CMD2**	**DATA**
CURRENT TIME SENSE	61	0C	04:TIMER 1	TIMER 1 DATA	74	00	*4
CURRENT TIME SENSE	61	0C	08:TIMER 2	NAK	11	12	*4
CURRENT TIME SENSE	61	0C	10:UB	LTC UB DATA	74	05	*12
CURRENT TIME SENSE	61	0C	20:VITC UB	VITC UB DATA	74	07	*12
IN DATA SENSE	60	10		IN DATA	74	10	*4
OUT DATA SENSE	60	11		OUT DATA	74	11	*4
A IN DATA SENSE	60	12		NAK	11	12	*4
A OUT DATA SENSE	60	13		NAK	11	12	*4
STATUS SENSE	61	20	*16	STATUS DATA	7X	20	*17
TIMER MODE SENSE	60	36		TIMER MODE STATUS	71	36	00:TC 01:TIMER 1 02:TIMER 2
				NAK	11	12	*18

Fig. 3–53–4 **Command Table**

*1. Tape speed and speed data (N) are defined as follows.

$$\text{TAPE SPEED} = 10^{(N/32\ -\ 2)} \quad \text{(decimal notation)}$$

(Ex.) TAPE SPEED	DATA N	
X0.1	32	(20H)
X1	64	(40H)
= X2.9	79	(4FH)

*2. DATA format

DATA 1		DATA 2		DATA 3		DATA 4	
10FR	FR	10SEC	SEC	10MIN	MIN	10HR	HR
MSD	LSD	MSD	LSD	MSD	LSD	MSD	LSD

Fig. 3–54 Data Format

*3. Percentage of offset speed from normal play is defined as follows;

SPEED OFFSET (%) = 0.1 x N (decimal notation)
N: SPEED DATA

*4. When VAR MEMORY is ON, cues up to the point;

IN POINT – (STORED INITIAL SPEED x PREROLL TIME)

*5. When VAR MEMORY is ON, the following operation is executed.

1) Cues up to the point;
IN POINT – (INITIAL SPEED SET x PREROLL TIME)
2) Runs to the IN point with the initial speed set.
3) Stores the trace of speed change which is given by VAR FORWARD or VAR REVERSE from the IN point.

*6. When VAR MEMORY ON, the following operation is executed.

1) Cues up to the point;
IN POINT – (STORED INITIAL SPEED x PREROLL TIME)
2) Runs to the IN point with the stored initial speed.
3) Plays back the stored speed from the IN point.

*7. When ANTI–CLOG TIMER ENABLE is established, the automatic mode transition occurs as follows;

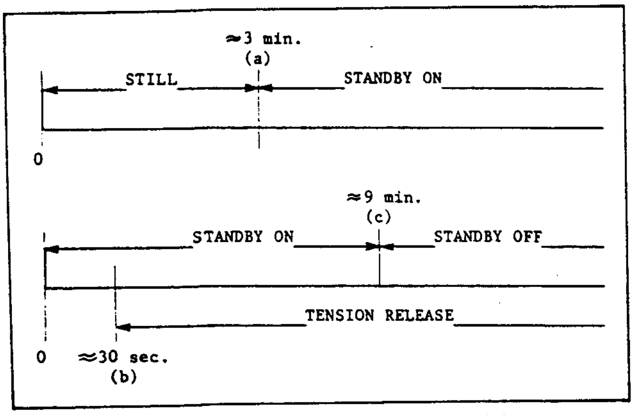


Fig. 3–55 Automatic Mode Transition

*8. Presets the initial speed of VAR MEMORY. DATA format is the same as *3.

*9. The channels whose EDIT PRESET is ON are set to EE mode. To reset the mode, EDIT OFF command is used.

*10. DATA format

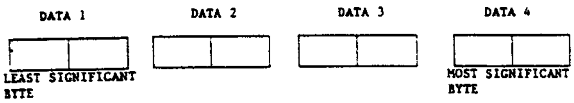


Fig. 3–56 Data Format

*11. Resets LOST LOCK status. LOST LOCK status is set when SERVO LOCK is unlocked in PLAY, RECORD or EDIT mode and it is not reset till LOST LOCK RESET command is accepted.

*12. DATA 1

7	6	5	4	3	2	1	0
	IMS	ASMBL	VIDEO			A2	A1
MSA							LSA

1: RESET 0: RESET

*13. DATA COUNT (X): 1 to F
DATA CODE: ASCII CODE

*14. DATA 1

7	6	5	4	3	2	1	0
MSB							LSa
MSD				LSD			

MSD: 0 to F The first DATA which is sent back.
LSD: 1 to F The bytes of DATA which are sent back.

(Ex.)
DATA 1 23H: 3 bytes from DATA 2 are sent back. (DATA 2, 3 and 4)

*15. STATUS DATA

DATA \ BIT	7 MSa	6	5	4	3	2	1	0 LSa
0			TAPE UNTHREAD	SERVO REF MISSING	TAPE TROUBLE	HARD ERROR		LOCAL
1	STANDBY		STOP		REW	FF	REC	PLAY
2	SERVO LOCK	TSO MODE	SHTL	JOG	VAR	TAPE DIRECTION 0=FWD	STILL	CUE OFF
3	AUTO MODE				A OUT	A IN	OUT	IN
4	SELECT EE ON	FULL EE ON		EDIT	REVIEW	AUTO EDIT	REVIEW	PREROLL
5		INS	ASMBL	VIDEO	SYNC/A4	A3	A2	A1
6		LAMP STILL	LAMP FWD	LAMP REW	← SEARCH LED → 8	4	2	1
7	VAR MEM MODE	VAR MEM ACTIVE	AUDIO SPLIT		DISP HOLD	SPOT ERASE		IN/OUT STATUS
8	BUZZER ALARM	LOST LOCK	NEAR EOT	EOT	COLOR FRAME LOCK	SERVO ALARM	SYSTEM ALARM	REC INHIBIT
9	FUNCTION ABORT			VID LACK	SYNC LACK			

Fig. 3–57 Status Data

*16. DATA 1

7	6	5	4	3	2	1	0
TIME OUT	FRAMING ERROR	OVERRUN ERROR	PARITY ERROR		CHECKSUM ERROR		UNDEFINED COMMAND
MSB							LSB

COMMAND COMPARISON TABLE

SMPTE is used for the cart machine mainly.
Black circle shows the new functions from AU-630.

Triangle shows the enhanced panel AU-A64 is necessary for AU-650.

COMMAND CMD1	COMMAND CMD2	DESCRIPTIONS	REMARKS	SUPPORT 650	SUPPORT SMPTE	SUPPORT 630
00	0C	LOCAL DISABLE		○	○	○
	10	DEVICE TYPE REQUEST		○	○	○
	11	DEVICE TYPE REQUEST		○	○	○
	1D	LOCAL ENABLE		○	○	○
	08	SYSTEM SYNC			○	○
01	XX	GROUP SET/RESET			○	○
02	XX	GROUP MASTER SET/RESET			○	○
03	00	TRIBUTARY RESET			○	
	04	VTR RESET			○	
	08	SEQ CONTROLLER RESET			○	
	81	TC RESET			○	

COMMAND CMD1	COMMAND CMD2	DESCRIPTIONS	REMARKS	SUPPORT 650	SUPPORT SMPTE	SUPPORT 630
20	00	STOP		○	○	○
20	01	PLAY		○	○	○
20	02	REC		○	○	○
20	04	STANDBY OFF		○	○	○
20	05	STANDBY ON		○	○	○
20	0D	DMC START	VAR MEMORY			●
20	0F	EJECT		○	○	○
20	10	FF		○	○	○
2X	11	JOG FORWARD		○	○	○
2X	12	VAR FORWARD		○	○	○
2X	13	SHTL FORWARD		○	○	○
20	14	STEP FORWARD				
20	20	REW		○	○	○
2X	21	JOG REVERSE		○	○	○
2X	22	VAR REVERSE		○	○	○
2X	23	SHTL REVERSE		○	○	○
20	24	STEP REVERSE				
20	30	PREROLL		○	○	○
24	31	CUE UP WITH DATA		○	○	○
25	31	SEARCH TO CUE				
21	38	PROGRAM SPEED +		○	○	○
21	39	PROGRAM SPEED −		○	○	○
20	3C	DMC PREROLL	VAR MEMORY			●
20	40	PREVIEW			○	○
20	41	REVIEW			○	○
20	42	AUTO EDIT			○	○
20	43	OUT POINT PREVIEW				●
20	4B	DMC RUN	VAR MEMORY			●
20	4C	DMC PREVIEW	VAR MEMORY			●
20	54	ANTI-CLOG TIMER DISABLE		○		
20	55	ANTI-CLOG TIMER ENABLE		○		
21	5C	DMC SET FORWARD	VAR MEMORY			●
21	5D	DMC SET REVERSE	VAR MEMORY			●
20	60	FULL EE OFF		○	○	○
20	61	FULL EE ON		○	○	○
20	63	SELECT EE ON		○	○	○
20	64	EDIT OFF		○	○	○
20	65	EDIT ON		○	○	○
20	66	△t PREVIEW OFF				
20	67	△t PREVIEW ON				
20	6E	STILL DIRECT OFF				
20	6F	STILL DIRECT ON				

COMMAND CMD1	COMMAND CMD2	DESCRIPTIONS	REMARKS	SUPPORT 650	SUPPORT SMPTE	SUPPORT 630
44	00	TIMER 1 PRESET		○	○	○
44	04	TIME CODE PRESET		○	○	○
44	05	UB PRESET		○		○
40	08	TIMER 1 RESET		○	○	○
40	0E	TCG HOLD		○		○
40	0F	TCG RUN		○		○
40	10	IN ENTRY		○	○	○
40	11	OUT ENTRY		○	○	○
40	12	A IN ENTRY	ENHANCED PANNEL	△	○	●
40	13	A OUT ENTRY	ENHANCED PANNEL	△	○	●
44	14	IN DATA PRESET		○	○	○
44	15	OUT DATA PRESET		○	○	○
44	16	A IN DATA PRESET	ENHANCED PANNEL	△	○	●
44	17	A OUT DATA PRESET	ENHANCED PANNEL	△	○	●
40	18	IN + SHIFT		○	○	○
40	19	IN − SHIFT		○	○	○
40	1A	OUT + SHIFT		○	○	○
40	1B	OUT − SHIFT		○	○	○
40	1C	A IN + SHIFT	ENHANCED PANNEL	△	○	●
40	1D	A IN − SHIFT	ENHANCED PANNEL	△	○	●
40	1E	A OUT + SHIFT	ENHANCED PANNEL	△	○	●
40	1F	A OUT − SHIFT	ENHANCED PANNEL	△	○	●
40	20	IN FLAG RESET		○	○	●
40	21	OUT FLAG RESET		○	○	●
40	22	A IN FLAG RESET	ENHANCED PANNEL	△	○	●
40	23	A OUT FLAG RESET	ENHANCED PANNEL	△	○	●
40	24	IN RECALL		○		○
40	25	OUT RECALL		○		○
40	26	A IN RECALL	ENHANCED PANNEL	△		●
40	27	A OUT RECALL	ENHANCED PANNEL	△		●
40	2D	LOST LOCK RESET		○	○	○
41	30	EDIT PRESET		○	○	○
44	31	PREROLL TIME PRESET		○	○	○
41	32	TAPE AUTO SELECT		△		●
41	33	SERVO REF SELECT		△		●
41	34	HEAD SELECT		○		○
41	35	COLOR FRAME SELECT		△		
41	36	TIMER MODE SELECT		○	○	○
41	37	INPUT CHECK		△		
4X	38	PB FIELD/FRAME SELECT		△		
41	39	REC FIELD/FRAME SELECT				
41	3A	EDIT FIELD SELECT				
41	3F	△t REC PRESET				
40	40	AUTO MODE OFF		○		○
40	41	AUTO MODE ON		○		○
40	42	SPOT ERASE OFF		△		●
40	43	SPOT ERASE ON		△		●
40	44	AUDIO SPLIT OFF	ENHANCED PANNEL	△	○	●
40	45	AUDIO SPLIT ON	ENHANCED	△	○	●
40	46	VAR MEMORY OFF	VAR MEMORY	△		●
40	47	VAR MEMORY ON	VAR MEMORY	△		●
40	48	VID REF DISABLE OFF		△		
40	49	VID REF DISABLE ON		△		

COMMAND CMD1	COMMAND CMD2	DESCRIPTIONS	REMARKS	SUPPORT 650	SUPPORT SMPTE	SUPPORT 630
61	0A	TC GEN DATA SENSE		○		○
61	0C	CURRENT TIME SENSE		○	○	○
60	10	IN DATA SENSE		○	○	○
60	11	OUT DATA SENSE		○	○	○
60	12	A IN DATA SENSE	ENHANCED PANNEL	△	○	●
60	13	A OUT DATA SENSE	ENHANCED PANNEL	△	○	●
61	20	STATUS SENSE		○	○	○
61	30	EDIT PRESET SENSE		○		○
60	31	PREROLL TIME SENSE		○		○
60	36	TIMER MODE SENSE		○	○	○

Fig. 3-58 RS-422-A Command Table

3–16. FRONT PANEL BOARD

The front panel board is an auxiliary system control board that handles all machine/sure interfacing that occurs through the front panel. Figure 3–59 shows a block diagram of the system.

Front panel key data is read by the CPU (IC4), through a 82C79 Keyboard Interface IC(IC27), which is located on the Front Panel C board. After the prescribed transmission commands are added, this data is relayed to the system control board. data from the system control board is processed by the CPU, and is displayed on the fluorescent information panel. Serial data, at 9600 baud, is used as the communication link between the two boards.

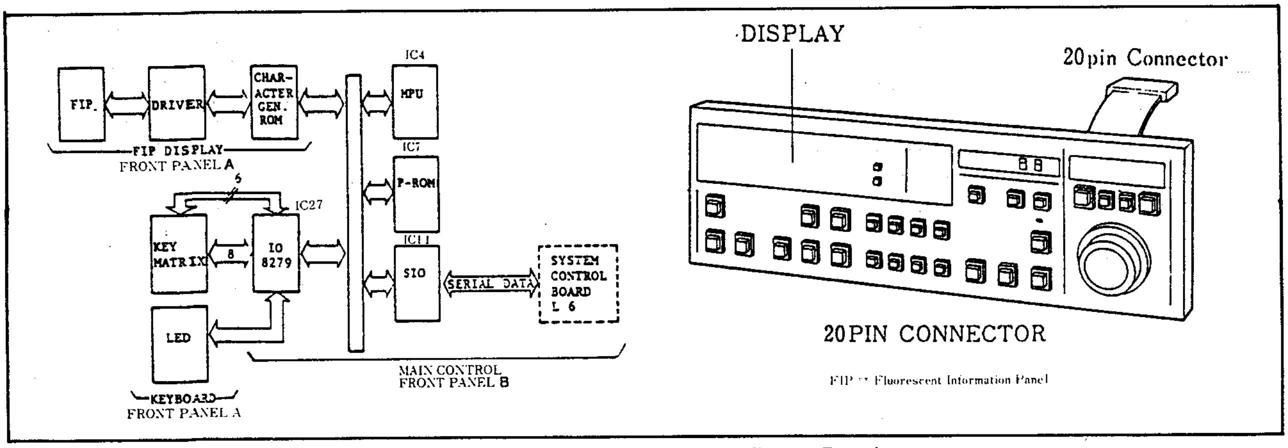


Fig. 3–59 Block Diagram of Front Panel

3–17. KEY SCANNING

Data from the front panel keyboard is input to the CPU, through the 82C79 keyboard/display interface (IC27). This IC is used for keyboard scanning, DIP switch data input, and also for driving the function indicator LED's. The 82C79 terminal diagram and functions are given in figure 3–60, and a more detailed function table is provided in figure 3–61.

KEY SCANNING

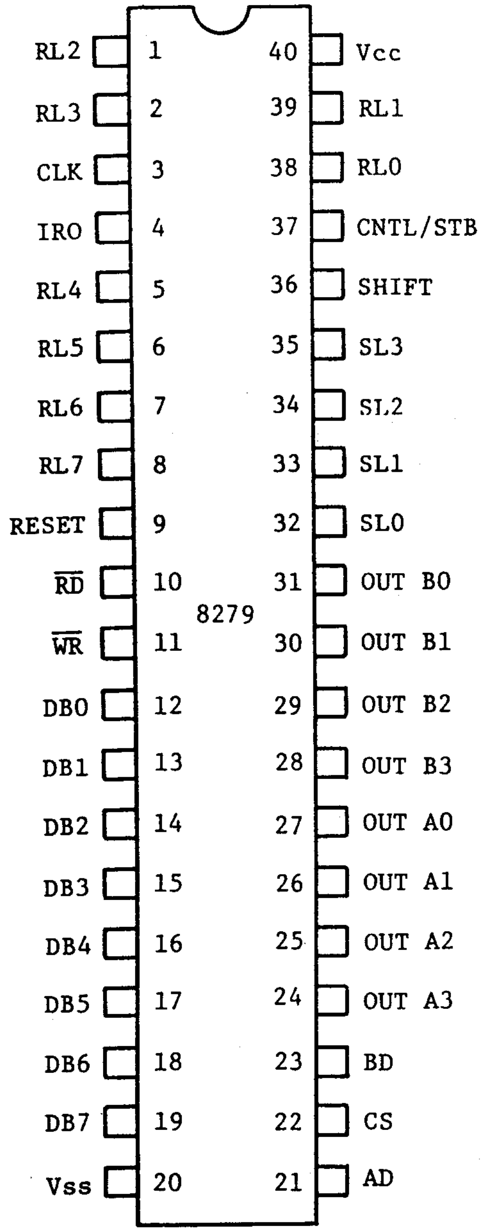
SC0, SC1 and SC3 generate the 8 bit scan line code, which is decoded into 8 lines by IC14. As can be seen in figure 3–64, 8 sequential scan pulses, designated KS0 KS1, KS3 and KS4, are produced. Each pulse represents a period in time when data can be input to the return line inputs (RL0 to RL7) of IC27.

The CPU (IC4) contains bit Address ports, which are used for system chip select, display tube control, and as high order address lines for the external 32K program ROM. RAM, and external 4k bytes of RAM are provided by IC8.

Key scanning and DIP switch reading is done using an 8 X 7 matrix, for the keyboard, and an 8 X 1 matrix for the DIP switches.

When the KS0 scan pulse is low, any of the DIP switches that are ON, will cause the corresponding bits of the RLO to RL7 inputs to go low. The other inputs are held high by the pull-up resistors. This data generated at the RL0 to RL7 inputs during the KS0's LOW period, will be interrupted by the CPU as DIP switch data Likewise, the KS2 to KS7 scan pulses are used to scan each column of the keyboard matrix.

A chart of which functions are controlled by which key scan pulse is shown in figure 3–49.



NAME	I/O	FUNCTION
DB07	I/O	DATA BUS (BI-DERECTIONAL)
CLK	I	CLOCK INPUT
RESET	I	RESET INPUT
CS	I	CHIP SELECT
RD	I	READ INPUT
WR	I	WRITE INPUT
A0	I	BUFFER ADDRESS
IRO	O	INTERRUPT REQUEST OUTPUT
SL03	O	SCAN LINES
RL07	I	RETURN LINES
SHIFT	I	SHIFT INPUT
CNTL/STB	I	CONTROL STROBE INPUT
OUT A03	O	DISPLAY (A) OUTPUTS
OUT B03	O	DISPLAY (B) OUTPUTS
BD	O	BLANK DISPLAY OUTPUT

Fig. 3-60 8279 Pin Configuration and Functions

Terminal	Name	I/O	Function
DO.D7	Bidirectional Data Bus	I/O	Delivery of data and commands to and from the CPU are made through the bidirectional data bus.
CLK	Clock Input	I	Clock signal from the system. Available for generating internal timing.
SO.S3	Scan Output	O	This output is used for scanning the key switch, Sensor Matrix, and display digits. The timing signal is outputted after being decoded or encoded according to the mode being used. An external decoded must be installed for the encode mode.
RO.R7	Return Line Output	I	This return input deals with the key and the sensor switch. It is also used as the 8 bit input in the Strobe mode. A pull-up resistor is internally connected so that the signal is High except when Low signal is inputted after the switch is pressed ON. Activates when the signal is Low.
DAO.DA3 DBO.DB3	Display A Output Display B Output	O	These output ports are used as 2 ports of 4 bits each or one 8 bit port, depending on the usage. Contents on the RAM is outputted synchronously with the scan timing signal. Two output ports can be independently blanked. Blanking turns the ports High, and a clear command turns the ports low.
BD	Display Blanking Output	O	This blanking signal prevents the scan timing signals from overlapping in the display during the signal change. This signal can also be turned "I" with the Display Blanking Command.

Fig. 3-61 Keyboard/Display Interface Detailed Function

Terminal	Name	I/O	Function
RESET	Reset Input	I	Activated try a high signal. After reset, 8279 is placed in left entry display mode and encoded display with 2 key rollover mode. The clock prescaled value becomes 31. The display RAM is not cleared.
CS	Chip select Input	I	Activated by a low signal.
AO	Command/Data Control Input	I	When this signal is "H", it indicates that the signal inputted or outputted through the data bus is either command or data information.
RD	Reading Control Input	I	Data-reading control input to the data bus.
WR	Willing Control Input	I	Command/data-writing control input from the data bus.
IRQ	Interrupt Request Output	O	When data is present in the FIFD under the Keyboard & Strobe mode, the signal turns "H" and sends interrupt request signal to the CPU. When multiple sets of data are present in the FIFO, the signal turns "L" once for each data. However, if data still read out remains in the FIFO, the signal turns "H" and again sends an interrupt signal to the CPU. In the Sensor Matrix mode, the Signal turns "H" if there is any change in the Sensor Matrix. To bring this mode back to "I", and interrupt stop command must be excuted.

INPUT No. / Scan No.	KS1	KS2	KS3	KS4	KS5	KS6	KS7
RL0	SPLIT EDIT ※N	EDIT ※N	PLAYER	OUT	PREVIEW		$\overline{\text{TC}}$
RL1	AUDIO OUT	PLAY ※N	RECORDER	SET	AUTO-EDIT	SHIFT	$\overline{\text{INT}}$ EXT
RL2	AUDIO IN	REC	INSERT	IN	PREROLL	ADJ	$\overline{\text{DF}}$ NDF
RL3		STOP	ASSEMBLE	GO TO	REVIEW	START	
RL4		JOG	VIDEO	TRIM +		RESET	$\overline{\text{LTC}}$ VITC
RL5		VAR	CH1	TRIM −		HOLD	
RL6		SHTL	CH2		FF	CTL/TC	
RL7		VAR. MEN.	TIME-CODE	READY	REW		

Fig. 3-64 Key Scan Table

3-18. FLUORESCENT INFORMATION PANEL (FIP)

The AU-630 Incorporates a 64 character, alphanumeric information display panel, organized as 2 lines of 32 information display panel, organized as 2 lines of 32 characters each. It is used to display information such as:

1. Mode
2. Speed
3. Time code
4. Lap Time
5. Editing In/Out Time
6. Error Messages

The display tube is controlled by the front panel syscon board, which receives the information to be displayed from the main system control. A character generator ROM (IC6) is used to store the character pattern data. The characters are comprised of a matrix of dots (5 x 7). This is shown in figure 3-65.

The 7 bit shift registers (5 for each line of characters), are used to transfer character ROM data to the display tube segments. Corresponding segment columns in each character are wired in parallel, and connected to the outputs of a shift register. This is illustrated in figure 3-68. When a character is to be displayed, 5 bits of data for each row of the character are shifted into the 5 shift registers. This is done for all 7 rows. When all the data is loaded (5 is done for all 7 rows), it is then sent to the display tube through the segment driver IC's as 35 parallel data.
Since all similar segment columns, in a given row, are wired together, some method must be used to determine at what location teh character will be displayed. This is accomplished by using a separator control grid for each characrer position (32 total).

These grids are sequentially activated (scanned) by a 5 line to 32 decoder circuit, comprised of IC's 1 and 2 . The outputs of this decoder are applied to ~~the~~ grids through the driver IC's 3, 4, 5, 6, 27, 28, 29, and 30. The CPU (IC4) coordinates the timing of ROM data output with grid scanning, so that the messages can be displayed. This operation is done at a fast enough rate, so the display sppears to be continuously illuninated.

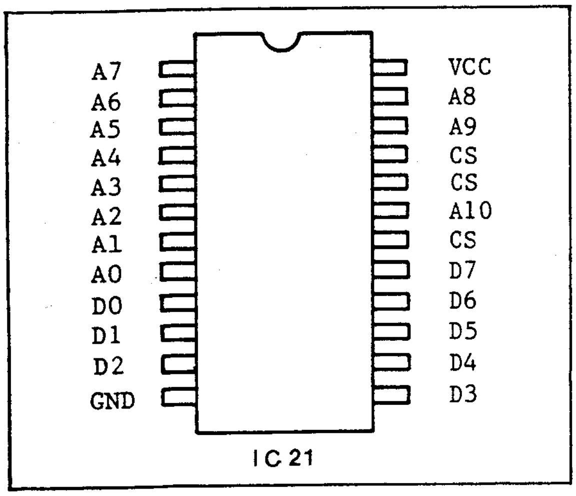


Fig. 3-65 Character Generator IC

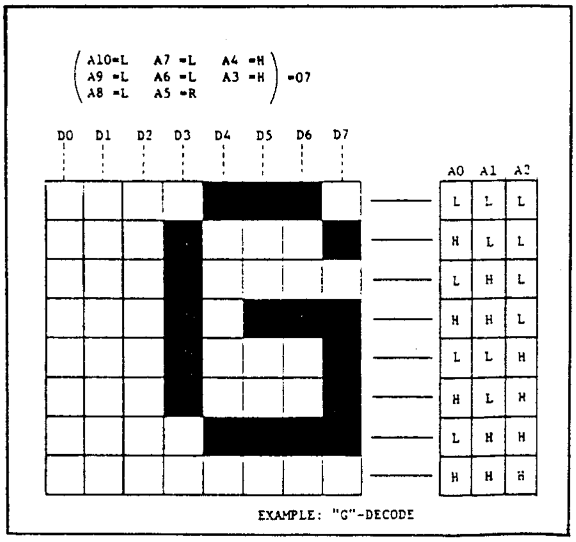


Fig. 3-66-2 Character Generator

※N : REC, EDIT and ERASE functions are not used in this model.

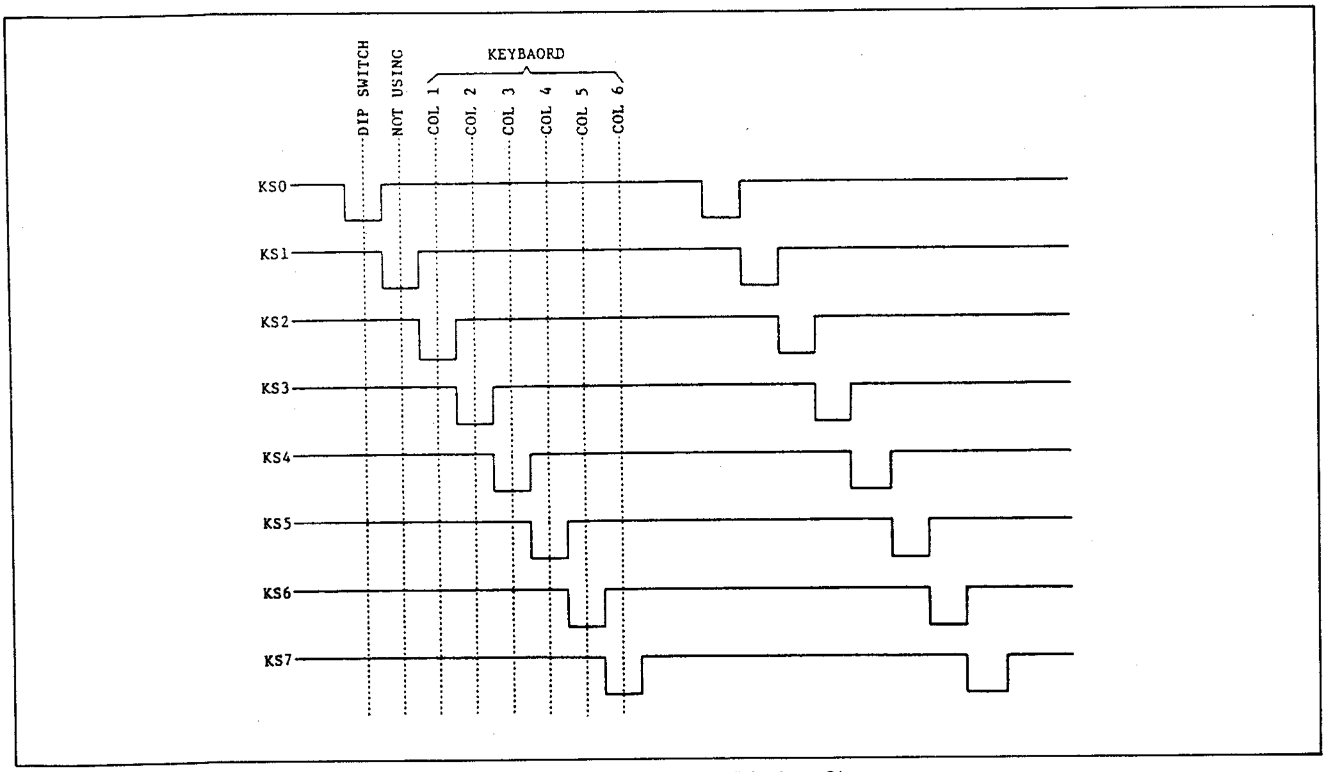


Fig. 3-62 Key Scan Timing Chart

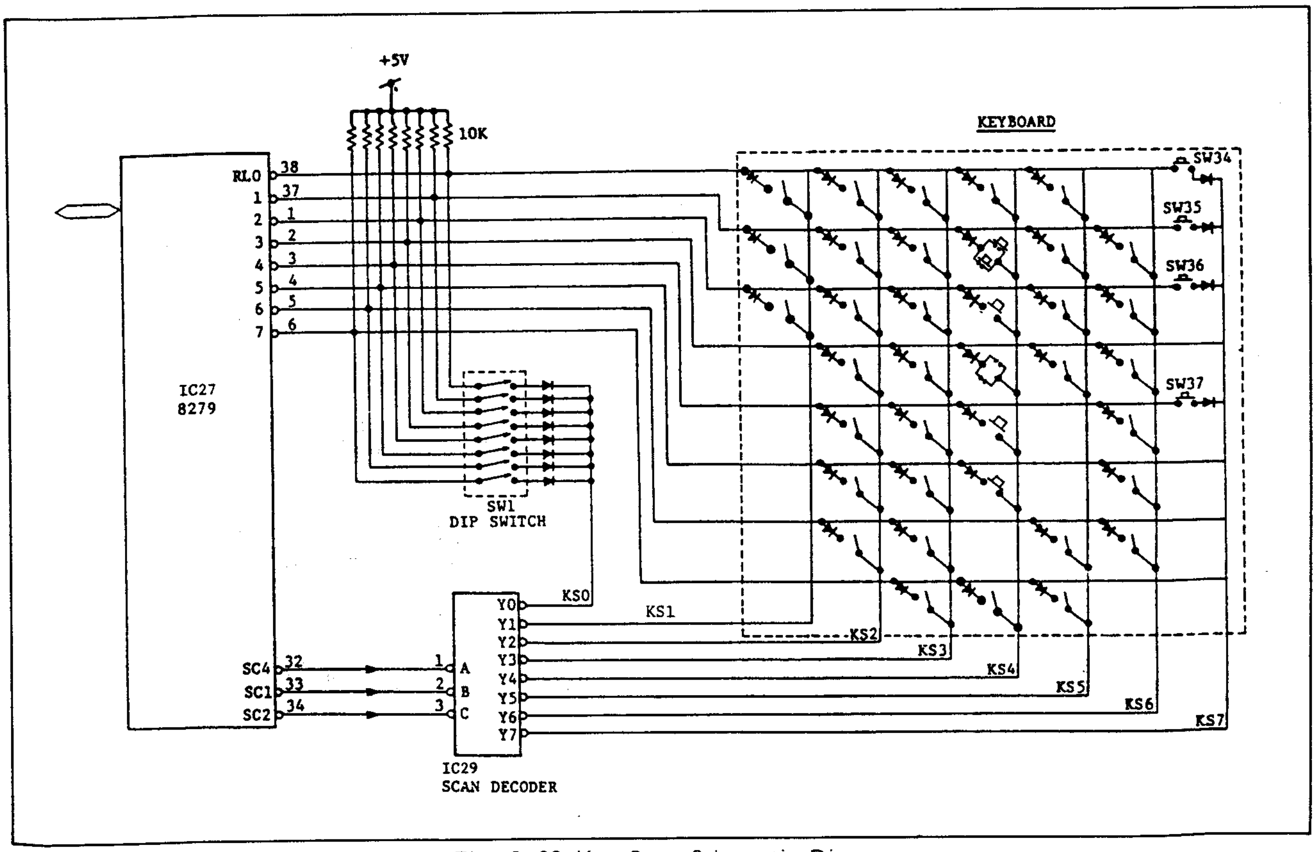


Fig. 3-63 Key Scan Schematic Diagram

Upper bits	A10	A9	A8	A7 \ A3	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
				Lower bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
				A6	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H
				A5	L	L	L	L	H	H	H	H	L	L	L	L	H	H	H	H
				A4	L	L	H	H	L	L	H	H	L	L	H	H	L	L	L	H
				A3	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H
0	L	L	L	L	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	L	L	L	H	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	_
2	L	L	H	L		!	"	#	$	%	&	'	(	)	*	+	,	−	.	/
3	L	L	H	L	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
8	H	L	L	L	■															
9	H	L	L	H																

Fig. 3-67 Character Generator

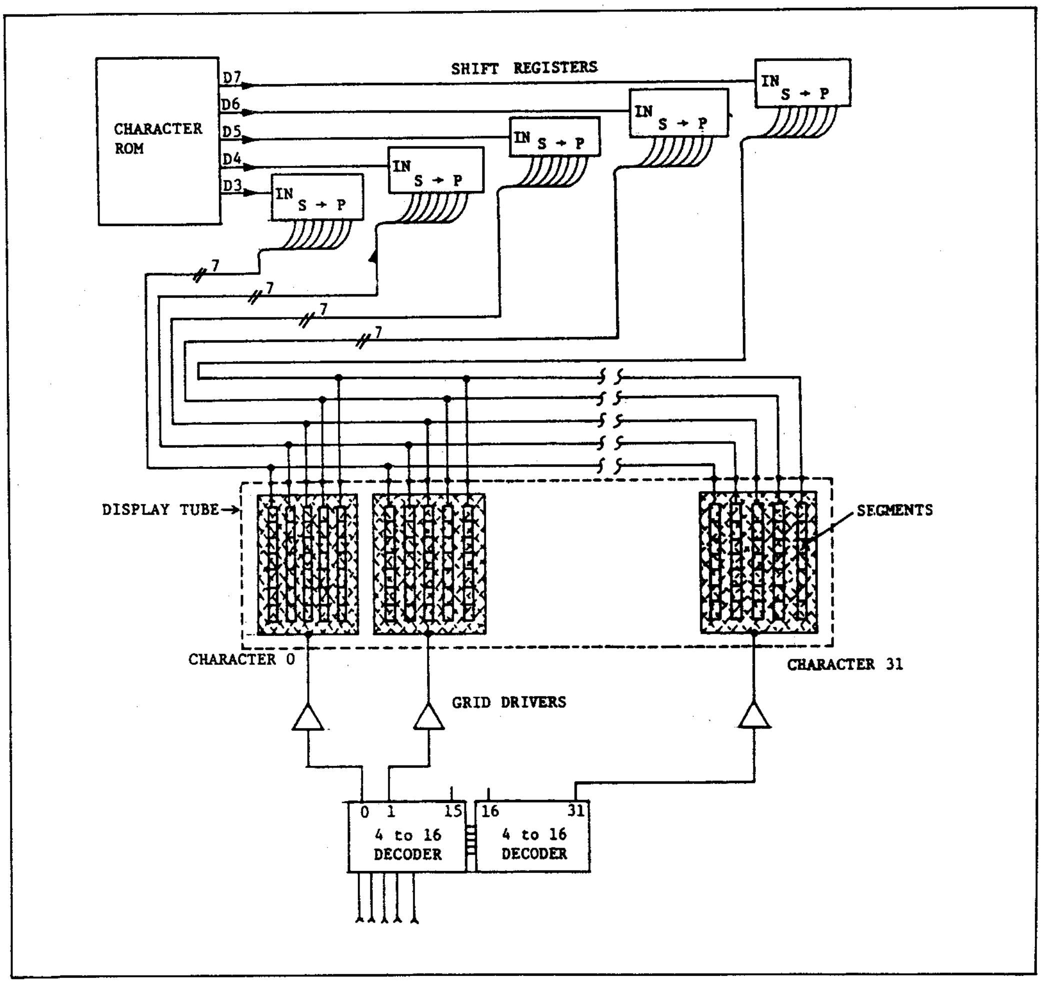


Fig. 3-68 Display Tube Drive

3–19. LED DRIVE

The LED DRIVE circuit is located on the Front Panel A board.
The front panel incorporates 57 LED's which are utilized as function indicators, a part of them are shown in figure 3–50. These LED's are controlled through 5 latched output ports, which receive data from the 82C79 Keyboard controller (IC27). Scan outputs SC0, SC1 and SC2 along with the BL output from IC27, are sent to a decoder (IC1). this is shown in figure 3–69.
This IC produces 7 sequential scan pulses, which are sent to the latch inputs of the LED data latches IC2 through IC8. IC3 through IC8 are identical circuit with IC2, so they are not described here.

LED drive data is output to ports A0 – A3, and B0 – B3, of IC27. This data is sent to all 7 latches. As data is output from IC27's port, it is latched into the appropriate LED drive latch, by the scan pulses. Each latch output is sent to an inverter/buffer transistor, before driving the LED.
Timing for the scan period is shown in figure 3–70.

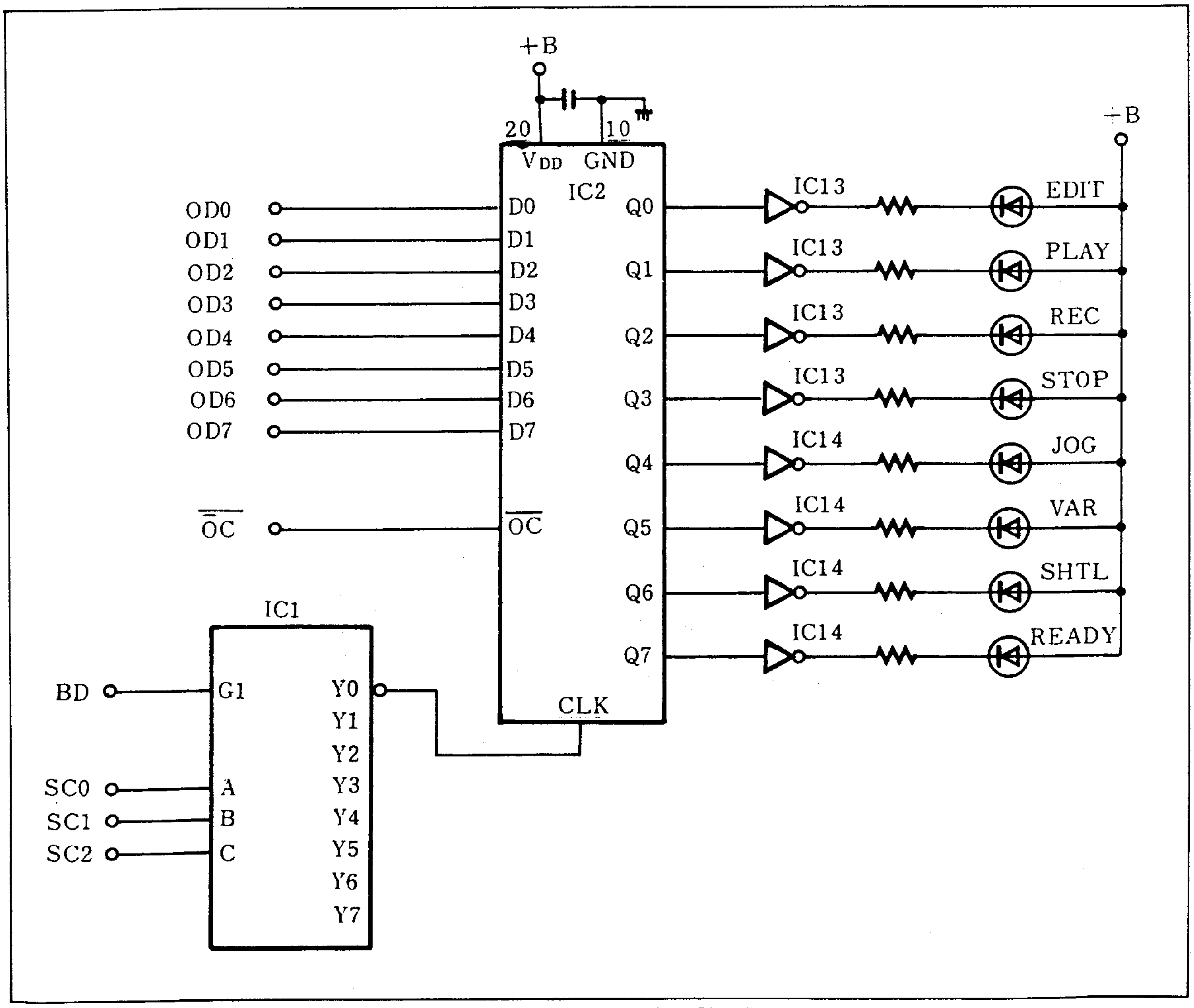


Fig. 3–69 LED Drive Circuit

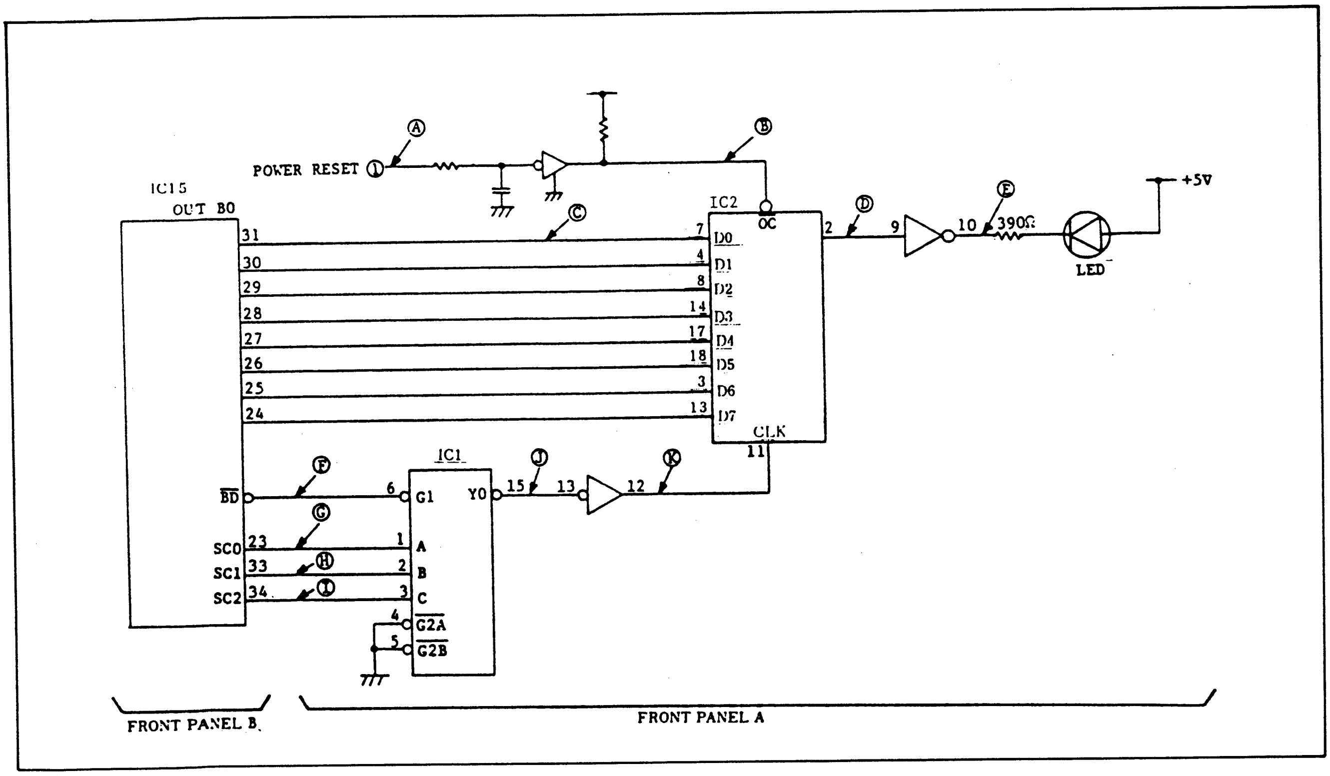


Fig. 3-70 LED Drive Circuit

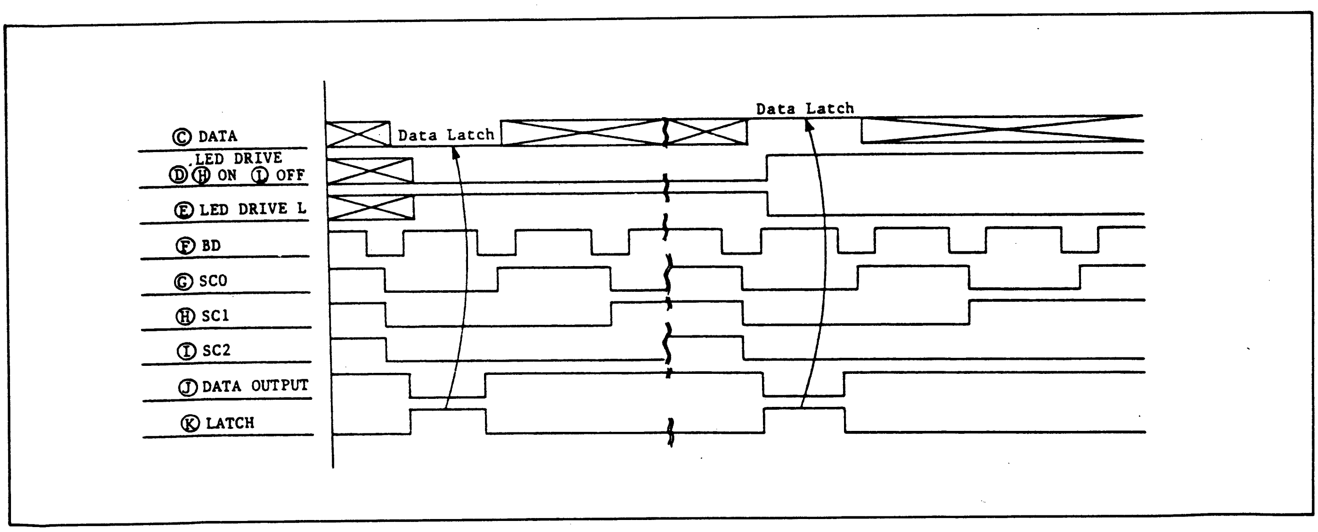


Fig. 3-71 EDIT LED Blanking Timing

3-20. PITCH CONTROL

Pitch Control circuit is used to control the capstan motor speed. Refer to Fig. 3-65. In the normal mode Reference 25Hz signal is supplied to the phase control circuit in IC40. In the pitch control mode, PC (Pitch Control) High signal is supplied to sw1 so the INT 25Hz signal is used to control the capstan phase.

This 25Hz signal is variable by dividing 2.98MHz. The 2.98MHz signal is variable, the frequency is controlled by the data PC1 – PC12 from the system control circuit. This data is controlled by a Search Dial.

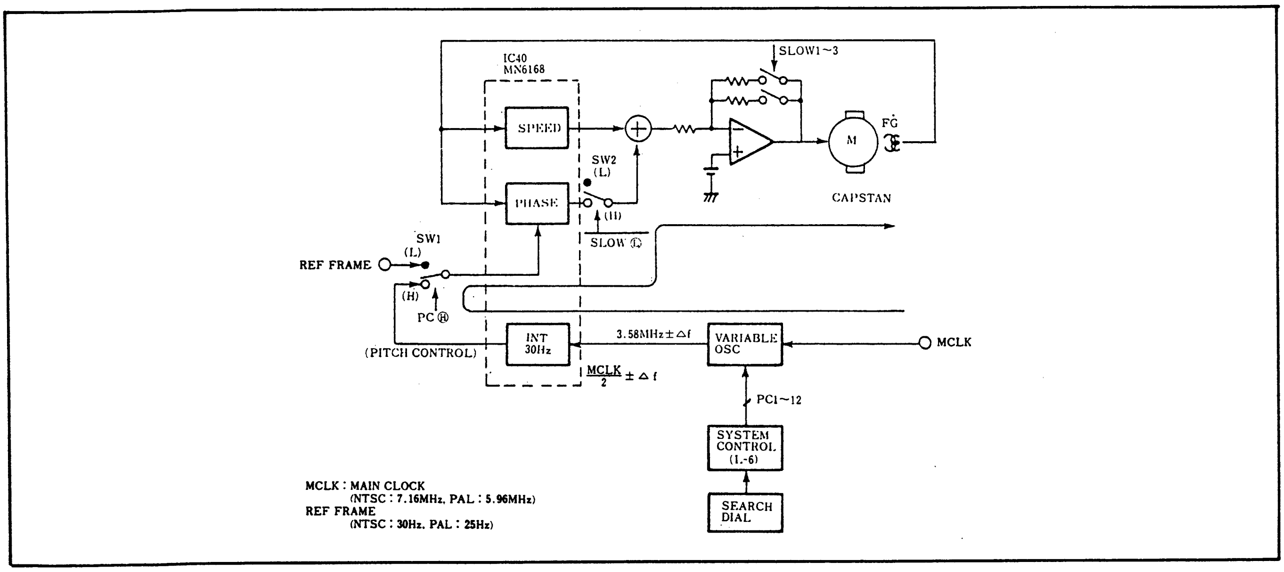


Fig. 3-72. Pitch Control Block Diagram

Nextly, the variable oscillator will be described.
Pitch Control data witch is controlled by a search dial is supplied to the variable oscillator from the system control circuit.
IC1 is I/O and IC2 through IC5 are BCD (Binary Code Digit) Divider Counter.
These Divider Counters divide the clock frequency according with the data from I/O.
IC5 is for 1 digit, IC4 is for 10 digit, IC3 is for 100 digit and IC2 is for 1000 digit.
So the these counters can count 0 through 9999. It means these counters are 10,000 counter.

In the normal speed condition 5,000 is supplied to the counters the dividing frequency can be calculated as follows.

Output Frequency = 5.96MHz x (Supplied Data)/ 10,000
Output Frequency = 5.96MHz x 5,000/10,000
= 5.96MHz x 1/2
= 2.98MHz

Output frequency can be controlled by the supplied data.

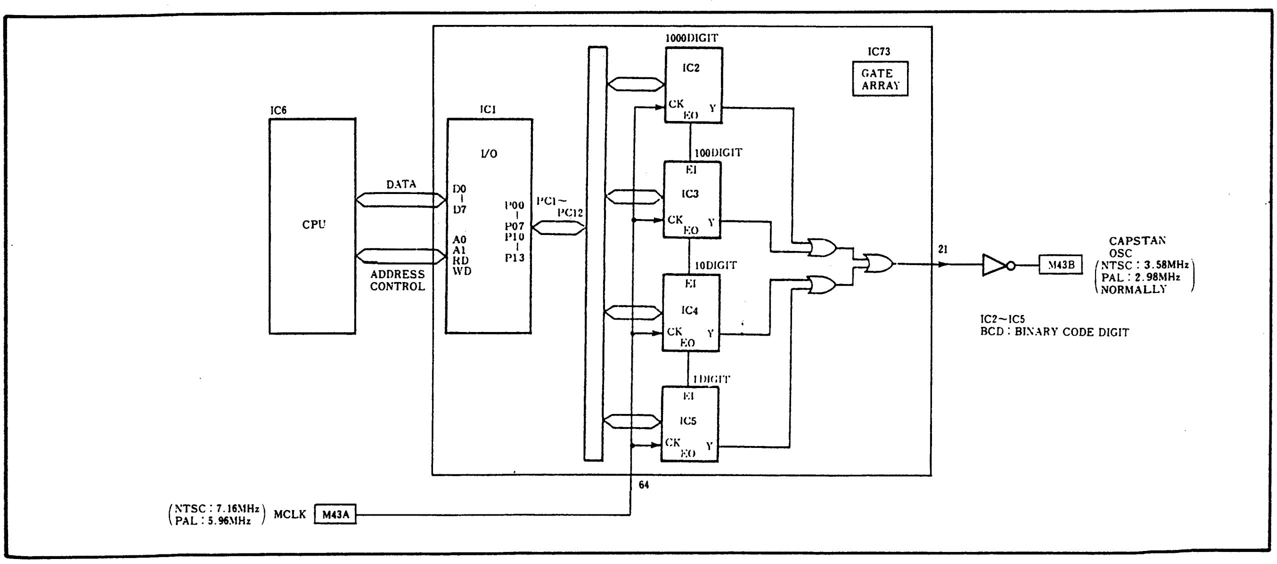


Fig. 3-73 Variable Oscillator

This Pitch Control circuit is used in the Program Play mode, Variable Play mode, TSO mode, and Capstan Override mode.

Fig. 3-67 shows the counter data in the Program Play mode.

MODE	PC1~12	SLOW	PC Ⓗ	SLOW 1	SLOW 2	SLOW 3	IC40 MODE
+20.0 [%]	6000	L	H	L	H	L	
↕	↕	↓	↓	↓	↓	↓	
+15.0	5750			H	H	L	
↕	↕			↓	↓	↓	
+1.0	5050						
↕	↕						
+0.2	5010						
+0.1	5001						
0	5000						×1
−0.1	4991						
−0.2	4990						
↕	↕						
−1.0	4950						
↕	↕						
−15.0	4250			L	H	L	
↕	↕			↓	↓	↓	
−20.0	4000						

$$n\% = 5000 + \frac{100 \times n}{2} \quad \text{[n : Control Speed]}$$

Fig. 3-67 Counter Data in the Program Play

Fig.3-68 shows the Counter Data in the variable play mode. Fig 3-69 shows the Counter Data in the Capstan override mode. Fig. 3-70 shows the Counter number in the TSO mode. Fig 3-71 shows the counter number in the Normal Speed.

MODE		PC1~12	SLOW	PC Ⓗ	SLOW 1	SLOW 2	SLOW 3	IC40 MODE
×2	64/32	5000	A00 L	L	L	L	H	×2
	60/32	4681	8D1		H	H	L	
	56	4371	86F		H	H	L	
	52	4060	80C		L	H	L	
	48	3750	6EA		L	H	L	
	44	3431	687		H	L	L	
	40	3121	625		H	L	L	
	36	2810	502 ↓	↓	L	L	L	
×1	32/32	5000	A00 L	L	L	L	H	×1
	30	4681	8D1		H	H	L	
	28	4371	26F		H	H	L	
	26	4060	80C		L	H	L	
	24	3750	6EA		L	H	L	
	22	3431	687		H	L	L	
	20	3121	625		H	L	L	
	18	2810	502 ↓	↓	L	L	L	
×1/2	16/32	5000	A00 L	L	L	L	H	×1/2
	15	4681	8D1		H	H	L	
	14	4371	86F		H	H	L	
	13	4060	80C		L	H	L	
	12	3750	6EA		L	H	L	
	11	3431	687		H	L	L	
	10	3121	625		H	L	L	
	9	2810	502 ↓	↓	L	L	L	
×1/4	8/32	5000	A00 L	L	L	L	H	×1/4
	7	4371	86F		H	H	L	
	6	3750	6EA		L	H	L	
	5	3121	625 ↓	↓	H	L	L	
×1/8	4/32	5000	A00 L	L	L	L	H	×1/8
	3	3750	6EAL	L	L	H	L	
×1/16	2/32	5000	A00 L	L	L	L	H	×1/16
×1/32	1/32	5000	A00 L	L	L	L	H	×1/32

PC	12	11	10	9	8	7	6	5	4	3	2	1
	1	0	1	0	0	0	0	0	0	0	0	0
BCD	5			0				0				0

※PC : Pitch Control
BCD : Binary Code Digit

Fig. 3–68 Counter Data in the Variable Play

MODE	PC1～12	SLOW	PC Ⓗ	SLOW 1	SLOW 2	SLOW 3	IC40 MODE
+25%	6250	L	L	L	H	H	×1
+12.5%	5621	L	L	H	L	H	
−12.5%	4371	L	L	H	H	L	
−25%	3750	L	L	L	H	L	

Fig. 3−76 Counter Data in the Capstan Override

MODE	PC1～12	SLOW	PC Ⓗ	SLOW 1	SLOW 2	SLOW 3	IC40 MODE
+6.3%	5311	L	L	L	L	H	×1
−6.3%	4681	L	L	H	H	L	

Fig. 3−77 Counter Data int TSO

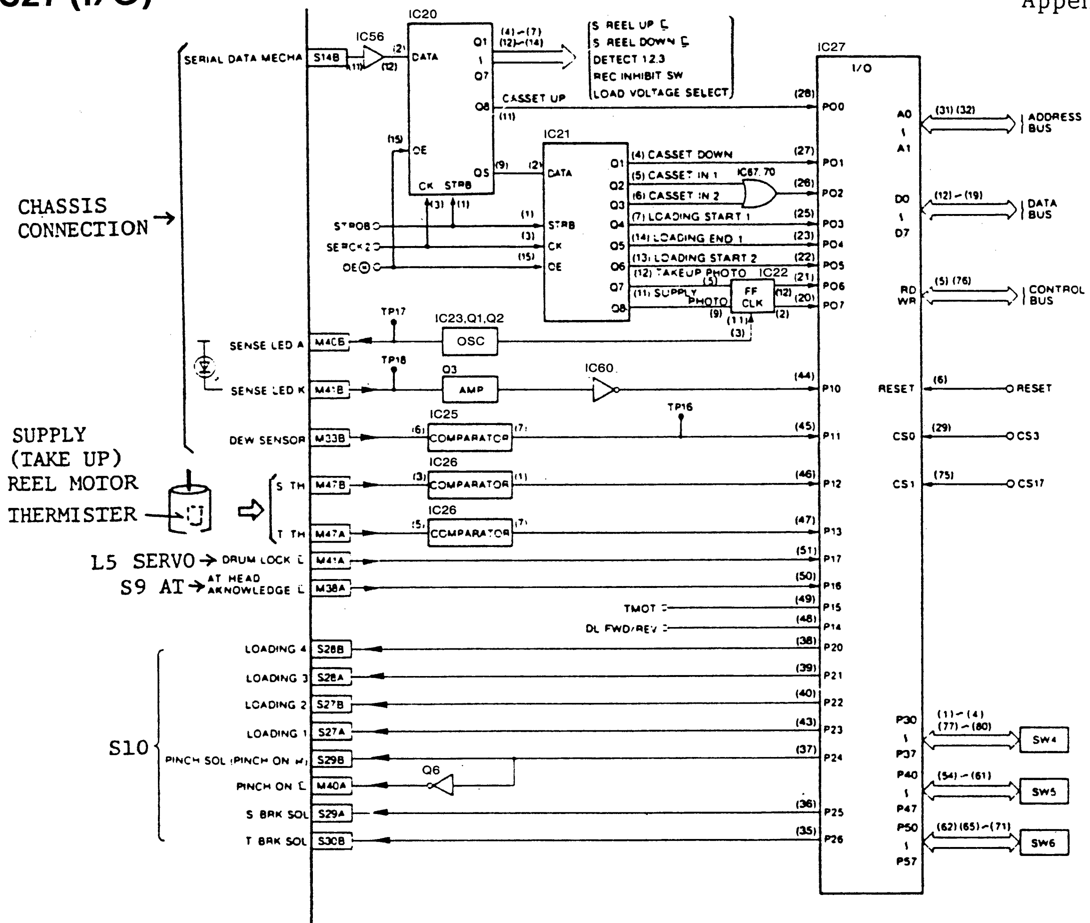
MODE	PC1～12	SLOW	PC Ⓗ	SLOW 1	SLOW 2	SLOW 3	IC40 MODE
NORMAL	5000	H	L	L	L	H	×1

Fig. 3−78 Counter Data in the Normal Speed

NOTE: Actual tape speed of each mode is as follows.

1. Program Play mode:
   −20% −−− +20% 0.1% step
2. Variable Play mode:
   −x1 −−− +x2 x1/32 step
3. Capstan Override:
   −15% −−− +15% 1% step
4. TSO mode:
   −15% −−− +15% 1% step
   (Front panel SW4−2 ON)
   −6.3% or +6.3%
   (Front panel SW4−2 OFF)

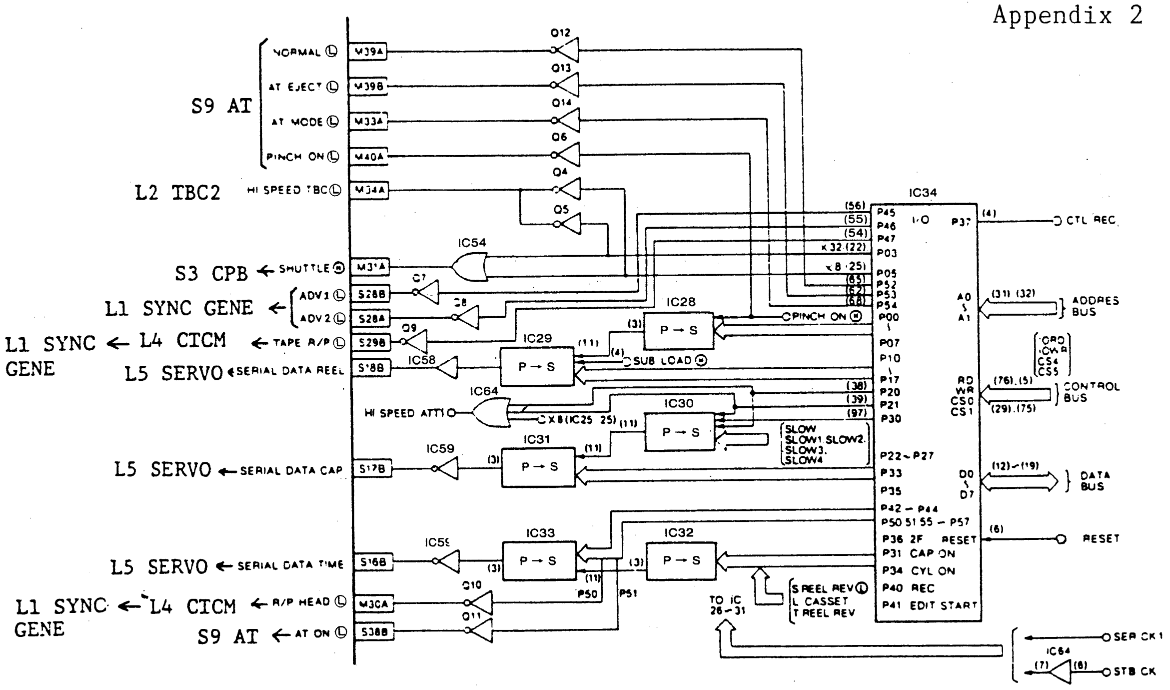
1) IC27 (I/O)



*TMOT = Time out (100ms)

No.	Name	I/O	Description	Purpose
S14B	SERIAL DATA MECHA	I	Serial Data for mechanism	Mechanism sensor detection
M40B	SENSE LED A	I	Sensor LED Anode	Sensor LED working check
M41B	SENSE LED K	I	Sensor LED kathode	Sensor LED working check
M33B	DEW SENSOR	I	Dew sensor	Humidity sensor
M47B	S TH	I	Supply Reel thermister	Reel stop at 194 F ~ 212 F (90℃ ~ 100℃)
M47A	T TH	I	Take up Reel thermister	Reel stop at 194 F ~ 212 F (90℃ ~ 100℃)
M41A	DRUM Lock L	I	Drum servo lock Low	To detect Drum servo is correct
M38A	AT HEAD AKNOWLEDGE L	I	At mode	To detect AT mode
S28B	LOADING 4	O	Loading motor speed control	To change tape loading speed
S28BA	LOADING 3	O	Elevator and Loading Motor FWD Ⓗ	To drive Elevator and Loading Motor in FWD
S27B	LOADING 2	O	Loading Motor ON Ⓗ	To drive loading motor
S27A	LOADING 1	O	Elevator Motor ON Ⓗ	To drive elevator motor
S29B	PINCH SOL (PINCH ON H)	O	Pinch solenoide on High	To drive pinch roller
M40A	PINCH ON L	O	Pinch solenoide on Low	To drive pinch roller
S29A	S. BRK SOL	O	Supply reel brake solenoid	To stop supply reel table
S30B	T. BRK SOL	O	Take up reel brake solenoid	To stop take up reel table

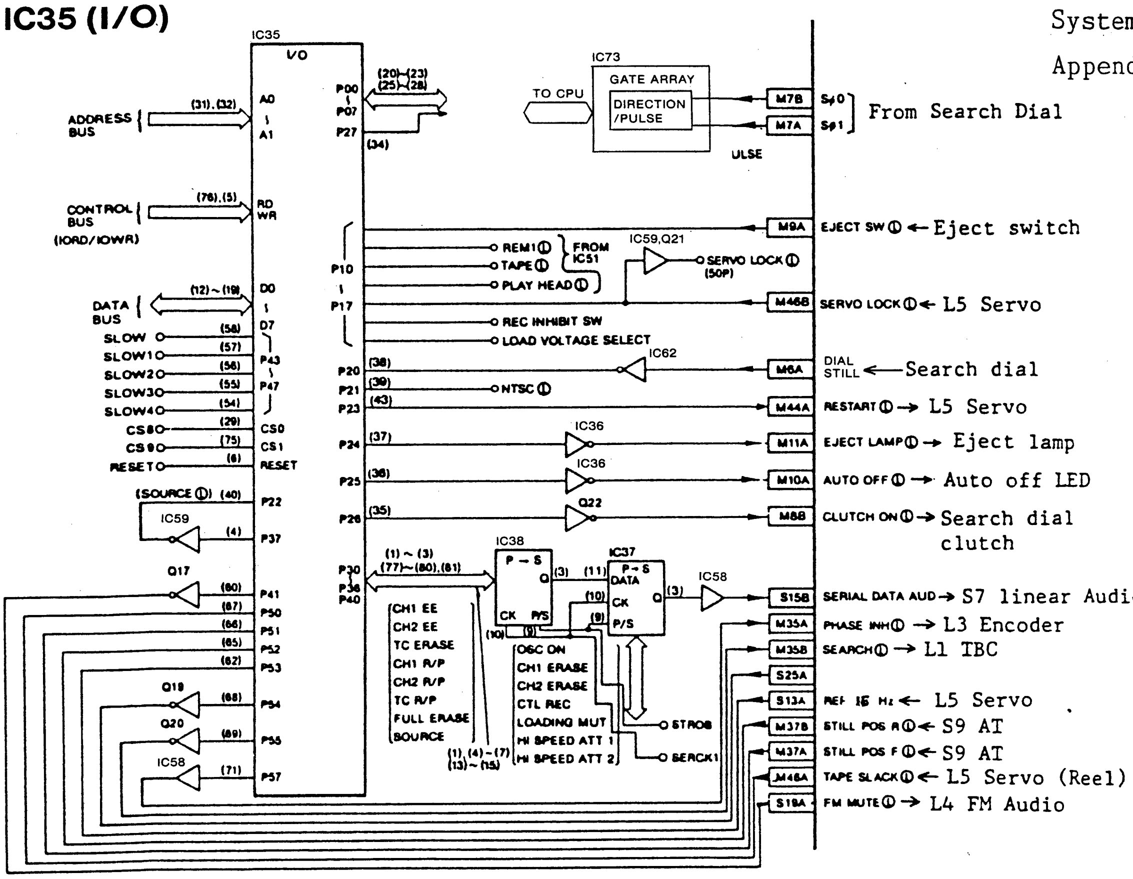
2) IC34 (I/O)



P → S : PARALLEL TO SERIAL CONVERTER

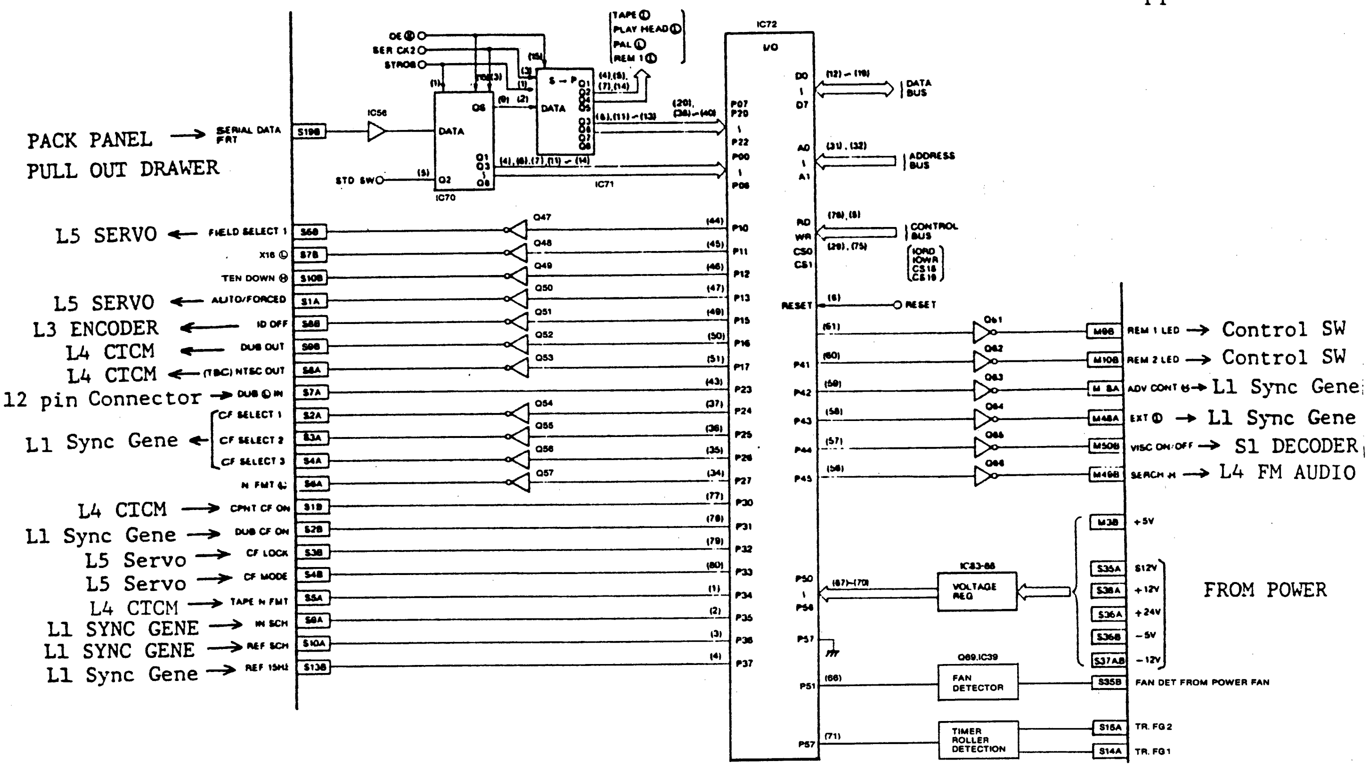
No.	Name	I/O	Description	Purpose
M39A	NORMAL L	O	R/P Head Playback Low	R/P head mode selection
M39B	AT EJECT L	O	Tape eject Low	To change play to EE mode
M33A	AT MODE L	O	AT mode Low	AT mode selection
M40A	PINCH ON L	O	Pinch on Low	Track beginning detection
M34A	HI SPEED IBC L	O	X8, X32 search Low	Serch VCO selection on TBC2(L2)
M31A	SHUTTLE H	O	X8, X32 search High	Color off, DOC sensor level up
S28B	ADV 1 L	O	Playback Low or Internal Low	Internal V sync High or Reference V sync Low on L1
S28A	ADV 2 L	O	REC High, Playback Low	Servo reference selection
S29B	TAPE R/P L	O	Confidence Playback	V sync position delay for AT head
S18B	SERIAL DATA REEL	O	Serial data for reel servo	Reel servo control
--	HI SPEED ATT 1	O	X2, X4, X8 search	Linear audio -10dB
S17B	SERIAL DATA CAP	O	Serial data for capstan servo	Capstan servo control
S16B	SERIAL DATA TIME	O	Serial data for edit timing	Edit timing control
M30A	R/P Head L	O	R/P Head Low, AT Head High	Servo reference selection
S38B	AT ON L	O	AT mode on Low	AT mode selection

3) IC35 (I/O)



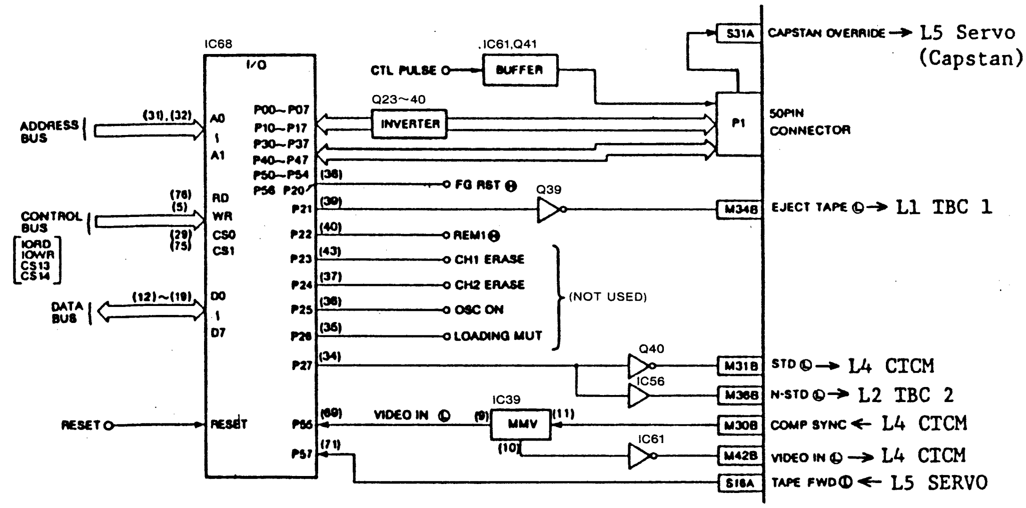
No.	Name	I/O	Description	Purpose
M7B	S 0	I	Search dial pulse phase 0°	Search dial rotation detection
M7A	S 1	I	Search dial pulse phase 90	Search dial rotation detection
M9A	EJECT SW L	I	Eject switch Low	Eject switch detection
M46B	SERVO LOCK L	I	Serve Lock Low	Drum and Capstan servo lock detection
M6A	D. STILL	I	Search dial still detent position	Search dial still position detection
M44A	RESTART L	O	Rotary Erase Start Low	To drive rotary erase circuit *N
M11A	EJECT LAMP L	O	Eject lamp Low	Eject lamp turns on
M10A	AUTO OFF L	O	Auto off Low	Auto off LED turns on
M8B	CLUTCH ON L	O	Search Dial clutch on Low	Set search dial still position
S15B	SERIAL DATA AUD	O	Serial data for Audio control	Linear Audio control *N
M35A	PHASE INH L	O	VISC phase control inhibit Low	VISC control on/off control
M35B	SEARCH L	O	Search Low	D.O.C. Inhibit during search mode
S13A	REF/4Hz	I	Servo reference REF/4Hz	Colour Framing Phase detection
M37B	STILL POS R L	I	Still position Reverse Low	AT tracking control in still mode
M37A	STILL POS F L	I	Still position Forward Low	AT tracking control in still mode
M46A	TAPE SLACK L	I	Tape slack Low	Tape slack detection by Reel rotation
S19A	FM MUTE L	O	FM Audio Mute Low	Mute FM Audio in

4) IC72 (I/O)



No.	Name	I/O	Description	Purpose	
S19B	SERIAL DATA FRT	I	Serial Data from Sub panel and Pull-out drawer		
S6B	FIELD SELECT 1	O	ODD/EVEN	CUT IN Field Selection	
S7B	FIELD SELECT 2	O	NOT USED		
S10B	FIELD SELECT 3	O	NOT USED		
S1A	AUTO/FORCED	O	Color Framing selection	Color Framing selection	
S8B	ID OFF	O	Color Framing Pb ID FLAG OFF	Color Framing selection	
S9B	DUB OUT	O	DUB OUT Mode		*N
S8A	NTSC OUT	O	NTSC OUT Mode		*N
S7A	DUB L IN	I	DUB Connector is available		*N
S2A	CF SELECT 1	O	Reference Color Framing selection		
S3A	CF SELECT 2	O	Reference Color Framing selection		
S4A	CF SELECT 3	O	Reference Color Framing selection		
S6A	N FMT L	O	NHK Format Low	NOT USED	
S1B	CPNT CF ON	I	Component Color Framing ON		*N
S2B	DUB CF ON	I	Dub Color Framing ON		*N
S3B	CF LOCK	I	CF Lock detection		
S4B	CF MODE	I	CF mode detection		
S5A	TAPE N FMT	I	Tape NHK mode detection	NOT USED	
S9A	IN SCH	I	Income SCH detection		
S10A	REF SCH	I	Reference SCH detection		
S13B	REF/2 Hz	I	Color Framing reference REF/2 Hz		
M9B	REM 1 LED	O	Remote LED 1 turns on		
M10B	REM 2 LED	O	Remote LED 2 turns on		
M8A	ADV CONT H	O	Advance control High		
M48A	EXT L	O	External Sync L		
M50B	VISC ON/OFF	O	VISC ON/OFF control		
M49B	SEARCH H	O	Search High		
M3B	+5V	I	+5V detection	Power monitor and warning	
S35A	S12V	I	S board circuit +12V detection	Power monitor and warning	
S38A	+12V	I	+12V detection	Power monitor and warning	
S36A	+24V	I	+24V detection	Power monitor and warning	
S36B	-5V	I	-5V detection	Power monitor and warning	
S37AB	-12V	I	-12V detection	Power monitor and warning	

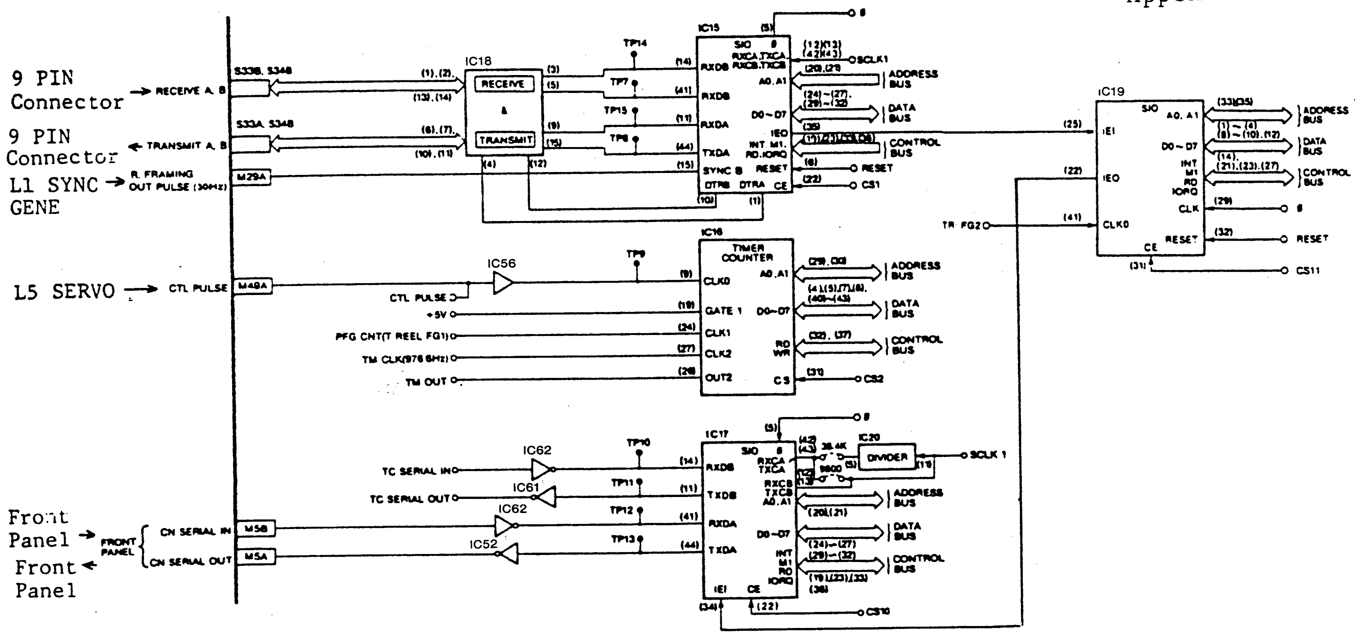
5) IC68 (I/O)



No.	Name	I/O	Description	Purpose
S31A	CAPSTAN OVERRIDE	O	Capstan override control	For syncronization of capstan
P1	50 PIN CONNECTOR	I	50 pin parrarell connector data	For Hard wired control
M34B	EJECT TAPE L	O	Eject condition Low	Video mute in Eject mode when tape is selected
M31B	STD L	O	Standard Video Input Low	Select VCO on CTCM (L4)
M36B	N-STD L	O	Non-standard Low	sELECT VCO on TBC2 (L2)
M30B	COMP SYNC	I	Income Y Composite sync	Income Video detection
M42B	VIDEO IN L	O	Video In Low	Income Video detection
S16A	TAPE FWD L	I	Tape forward Low	Tape direction detection

Fig.3-85 IC47 I/O Chart

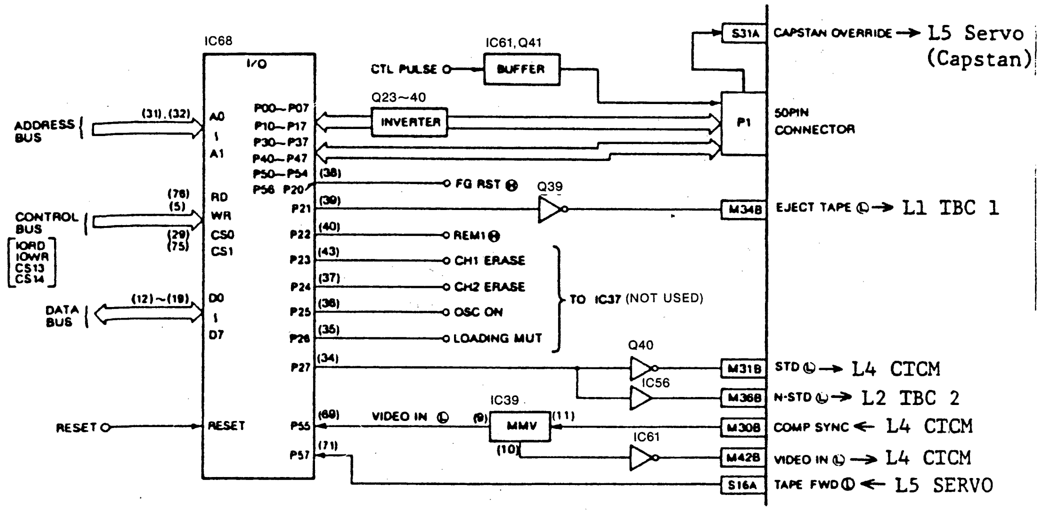
6) IC15 (SIO), IC16 (COUNTER), IC17 (SIO)



IC16 is used as 100m sec counter.
IC19is used as 2m sec counter.
TM CLK : Internal Timer clock.
PFG CNT : Short FF/REW in the case of transparent tape is detected.
Loading tension control.

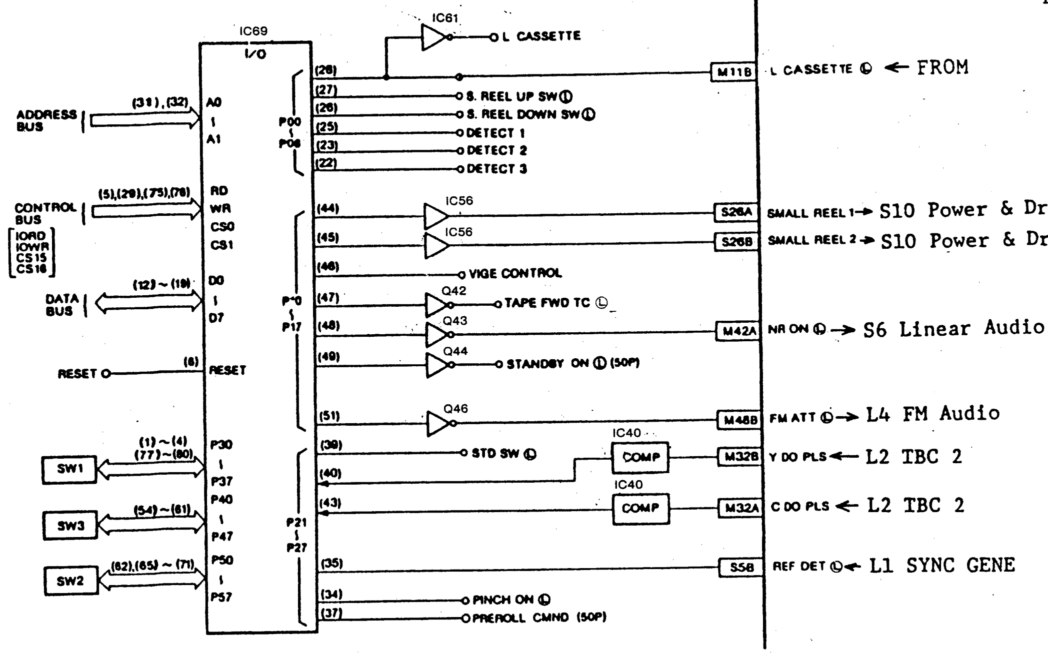
No.	Name	I/O	Description	Purpose
S33B	RECEIVE A	I	RS-422A SERIAL DATA REVEIVE	SERIAL INTERFACE (9 PIN CONNECTOR)
S34B	RECEIVE B	I	RS-422A SERIAL DATA REVEIVE	SERIAL INTERFACE (9 PIN CONNECTOR)
S33A	TRANSMIT A	O	RS-422A SERIAL DATA TRANSMIT	SERIAL INTERFACE (9 PIN CONNECTOR)
S34B	TRANSMIT B	O	RS-422A SERIAL DATA TRANSMIT	SERIAL INTERFACE (9 PIN CONNECTOR)
M49A	CTL PULSE	I	CONTROL PULSE	To count LAP time
M5B	CN SERIAL IN	I	Front Panel Serial data In from Connector	Key data input from Front Panel
M5B	CN SERIAL OUT	O	Front Panel Serial data OUT to Connector	Display data output to Front Panel

7) IC68 (I/O)



No.	Name	I/O	Description	Purpose
S31A	CAPSTAN OVERRIDE	O	Capstan override control	For syncronization of capstan
P1	50 PIN CONNECTOR	I	50 pin parrarell connector data	For Hard wired control
M34B	EJECT TAPE L	O	Eject condition Low	Video mute in Eject mode when tape is selected
M31B	STD L	O	Standard Video Input Low	Select VCO on CTCM (L4)
M36B	N-STD L	O	Non-standard Low	sELECT VCO on TBC2 (L2)
M30B	COMP SYNC	I	Income Y Composite sync	Income Video detection
M42B	VIDEO IN L	O	Video In Low	Income Video detection
S16A	TAPE FWD L	I	Tape forward Low	Tape direction detection

8) IC69 (I/O)



No.	Name	I/O	Description	Purpose
S26A	SMALL REEL 1	O	Small Reel Drive 1	Small Reel Speed Control
S26B	SMALL REEL 2	O	Small Reel Drive 2	Small Reel Speed Control
M42A	NR ON L	O	Noise Reduction On Low	Noise Reduction ON/OFF selection
M48B	FM ATT L	O	FM Audio Attenuator on Low	10dB down in VAR mode
M32B	Y DO PLS	I	Y Drop out pulse	Y Drop out componsation
M32A	C DO PLS	I	C Drop out pulse	C Drop out componsation
S5B	REF DET L	I	Reference Video Sync Detect Low	Reference Video Detection
M11B	L CASSETTE (L)	I	When Large Cassette is Inserted to the Cassette Garage Low Signal is Generated	Large or small cassette detection

4. POWER SUPPLY (SWITCHING REGULATOR)

GENERAL DESCRIPTION

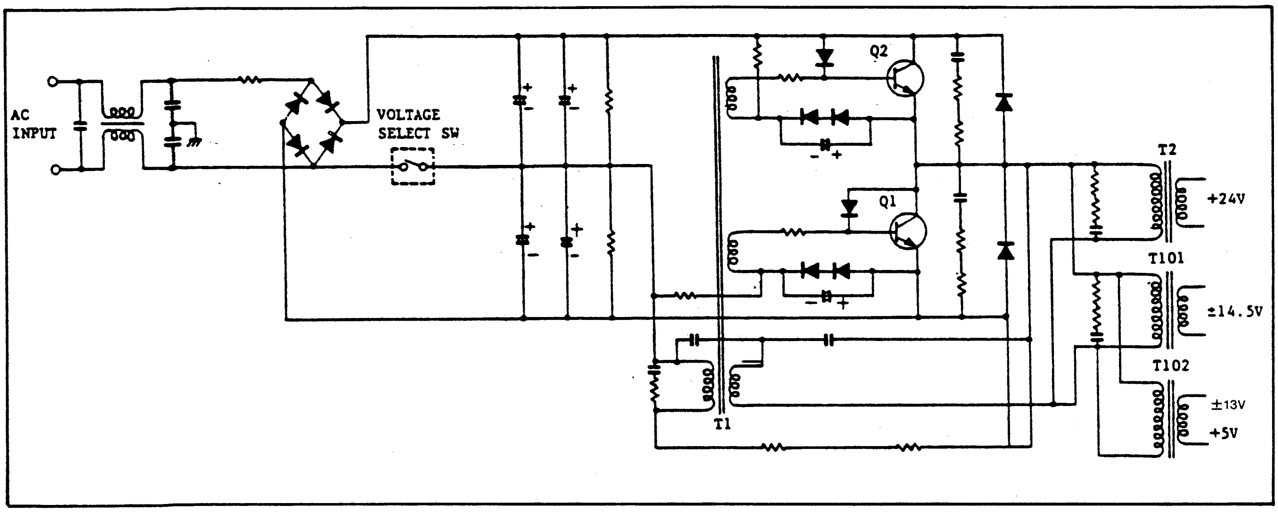


Fig. 4–1 Primary Circuit

4–1. Power Voltage
This model has a switching regulator power supply circuit which supplies the following voltages.

(1) +24V
(2) +–14.5V
(3) +–13V
(4) +5V

This unit will accept AC inputs of 100V to 120V AC, and 200V to 240V AC. The range is set with a voltage switch.

DETAILED DESCRIPTION

4–2. PRIMARY CIRCUIT

The switching regulator power supply has an oscillator circuit which drives a transformer generating a secondary voltage. A self–oscillation circuit is adopted in this section with a frequency of approximately 50kHz.

4–3. +24V REGULATOR

This circuit makes +24V power from a secondary AC output. The output AC power signal is rectified by the dual diode assembly D23, coils L3, L4 and capacitors C22 and C23. Transistors Q6 and Q8 are regulators. Refer to figure 4–2.

4–4. +–14.5V REGULATOR

Refer to figure 4–3. This section consists of a regulator circuit and a voltage control circuit.
Diodes D101, D102, coils L101, L102 and capacitors C103, C104, C105, C106 form a rectifier circuit which regulate the +–14.5V. The lower circuit is a feedback control circuit which detects the output voltage and changes the magnetic flux density to control the output voltage. Diode D103, coil L104 and capacitor C107 form the sub power rectifier which is used to change the magnetic flux density.
Transistor Q101 is the driver which controls the magnetic flux density.

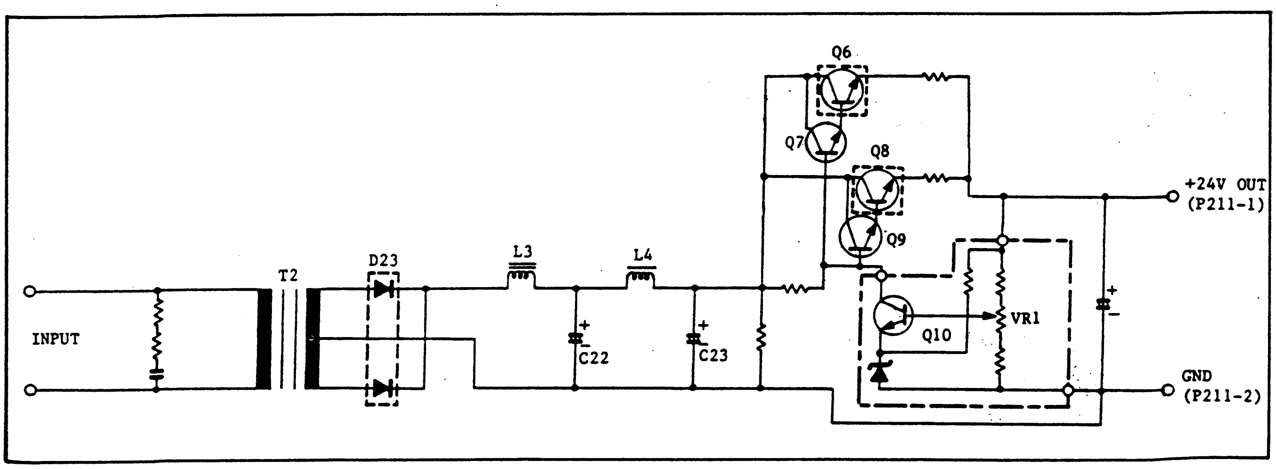


Fig. 4–2 +24V Regulator

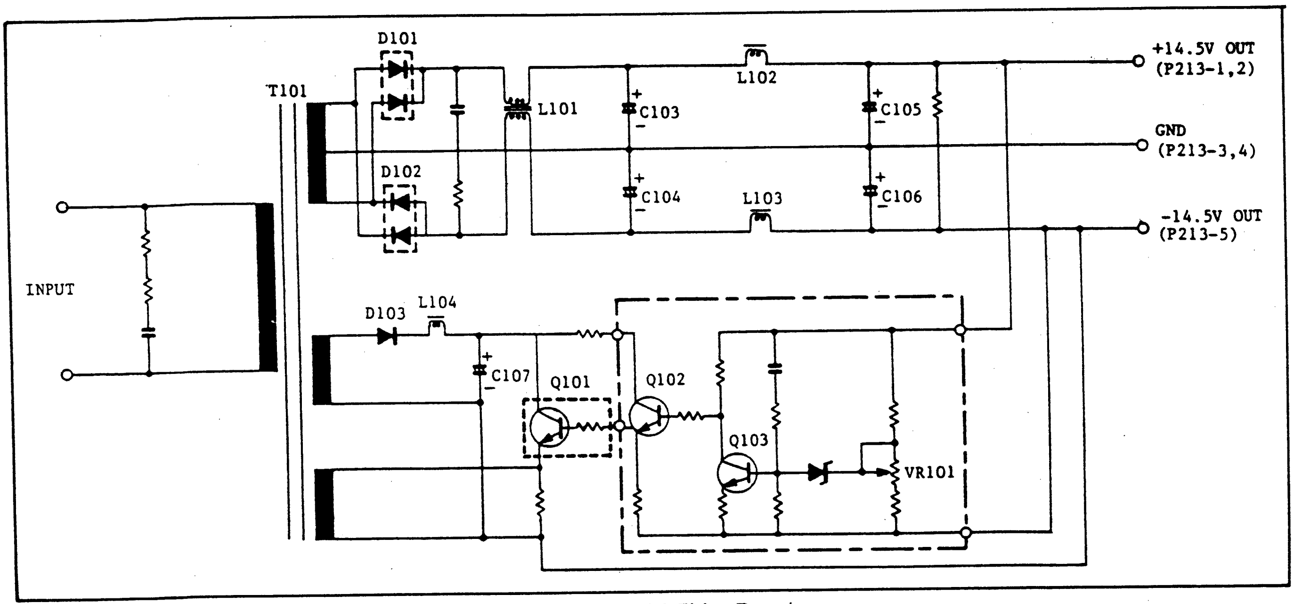


Fig. 4–3 +–14.5V Regulator

4–5. +13V AND +5V REGULATOR

Refer to figure 4–4. This circuit is similar to the +–14.5V regulator. To control the regulation voltage more accurately, the feed back +5V is supplied from the mother board. the +–13V regulator is controlled by the +5V regulator. The +–13V rectifier circuit consists of diodes D105, D106, coil L105, L106, L107 and capacitor C110–C113. The +5V rectifier circuit consists of diode D107, coils L108, L109 and capacitor C115, C116. Diode D108, coil L110 and capacitor C117 form the regulator to control the magnetic flux density. Transistor Q104 is the driver which controls the magnetic flux density.

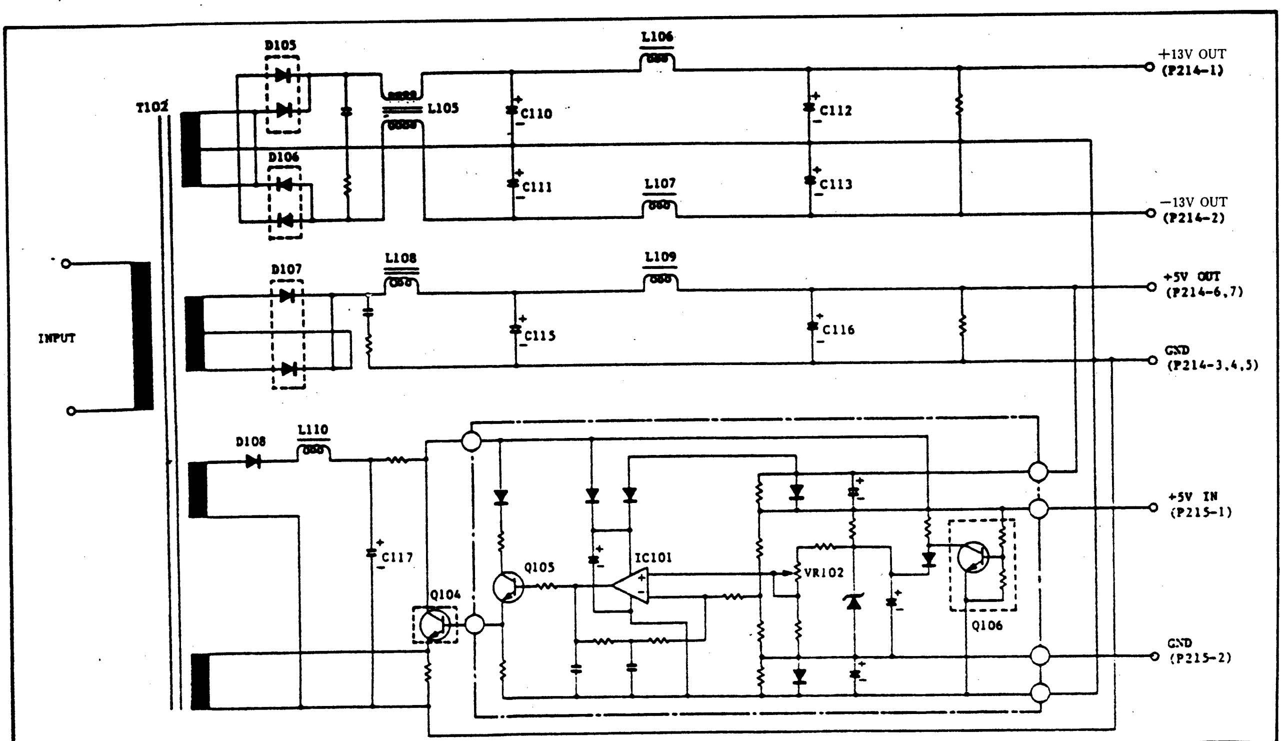


Fig. 4–4 +–13V & +5V Regulator

POWER DRIVE BOARD (S10)

The following circuits are located on the power drive board.

1.) VOLTAGE REGULATORS

A.) +12V for the large circuit boards
B.) +12V for the small circuit boards
C.) −12V
D.) −5V
E.) +5V

2.) MOTOR DRIVE CIRCUITS

A.) Elevator loading motor
B.) Loading motor
C.) Small cassette reel motor

3.) SOLENOID DRIVE CIRCUIT

A.) Pinch solenoid
B.) Take up brake solenoid
C.) Supply brake solenoid
D.) Loading lock solenoid

An overall block diagram of the power drive board is shown in figure 4–5.

4–6. +12V REGULATOR CIRCUIT

Refer to figure 4–6. The regulator circuit provides both voltage regulation and over–current protection to the 12 volt line. Voltage regulation is accomplished as follows: +14V volts from the switching power supply is applied to this circuit through connectors P7 and P8 AB. A reference voltage, for differential amplifier IC9, is produced by R164 and zener diode D14. This voltage (+4.7V) is applied to the negative input (pin 2) of IC9. The positive input (pin 3), receives a starting voltage (about 3.3V) from resistive divider R152 and R153, through D42. Pin 3 is also connected to the wiper of variable resistor VR72 (voltage adjustment) which, along with R71 and R72, form a voltage divider across the 12V regulated output. When power is first applied, the positive input (pin 3) voltage is lower than the reference voltage at the negative input (pin 4). This will cause a negative output to be produced at pin 1, causing base current to flow through Q10 turning it on. Q22 and Q8 will then be turned on through D13. When Q22 is turned on, voltage will be passed to the output side of the circuit. By comparing the divided down output voltage against the stable reference voltage, IC9 will maintain stable voltage regulation. If the load is increased, the output voltage will decrease, this will cause pin 3 of IC9 to become lower than pin 2. Pin 1 will go negative turning Q10, Q8 and Q22 on harder, thus increasing the output voltage.

If the load were to decrease, pin 3 would become higher than pin 2 and pin 1's output would become positive. This will decrease the conduction of Q10, 8 and 22 lowering the output voltage. By this means the voltage at point "A" is kept at a constant +12 volts.

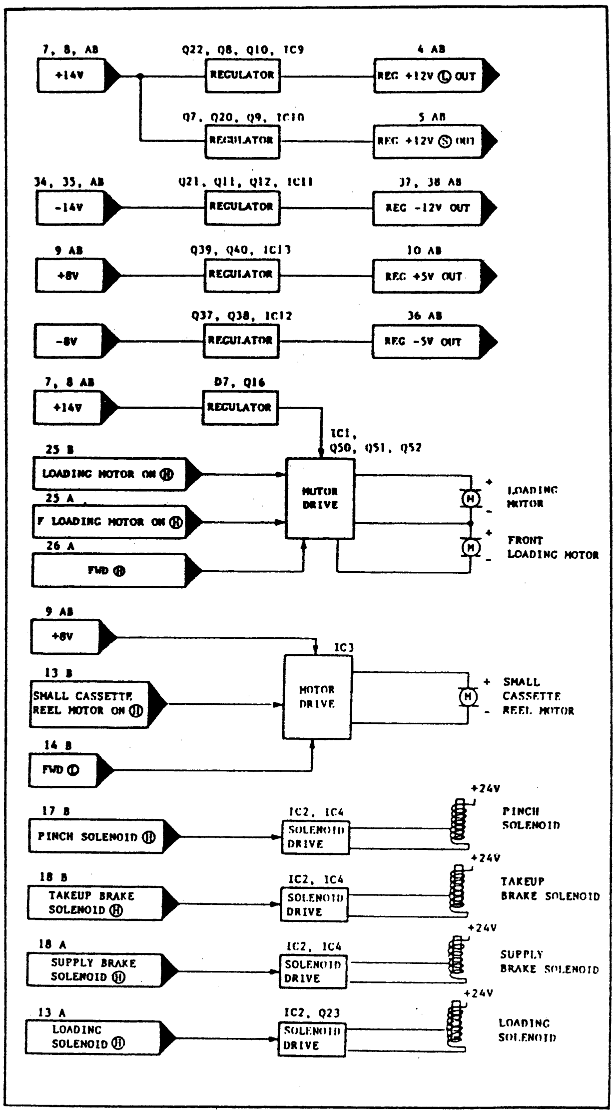


Fig. 4–5 Simplified Block Diagram of Power Drive Circuit

4–7. OVER–CURRENT PROTECTION

In order to protect the regulator circuit against overload, over–current protection is provided using the following circuit. All load current must pass through R65, a 0.1ohm resistor. A differential amp, (IC9 B) is connected across this resistor with its positive input (pin 5) connected to the supply side through R168 and 169, and its negative input (pin 6) connected to the load side. When the load current increases above 5 amps. The voltage drop produced across R65, causes the negative input of IC9B to become lower than the positive input. When this happens, output pin 2 will go high. This high (approximately 14V), is sent to the positive input (pin 3) of the voltage regulator (IC9A) through D41. This will cause Q10, 8 and 22 to be turned off causing the +12V output to become zero, thus protecting the circuit. Fast action of this circuit is provided by D47 and Q26 which feedback to the current sensing IC's inputs to assure quick switch over.

4-8. STARTUP OVERRIDE

When power is first applied to the regulator circuit, the startup load current may be greater than 5 amps. To prevent false operation of the over-current protection circuit at this time the following circuit is provided. When 14 volts is applied at power on, a time constant formed by C59, R75 & R76 turn on Q25 for approximately 1 second, Q25's collector holds the positive input of IC9B low for this time and thus prevents this IC from sensing the voltage drop across R65.

4-9. OTHER REGULATORS

Construction and operation of the other regulators, +5, −5 and −12V, is similar.

MOTOR DRIVE CIRCUIT

This circuit drives the loading motor, elevator loading motor and small cassette reel elevator motor. Refer to figure 4-7.

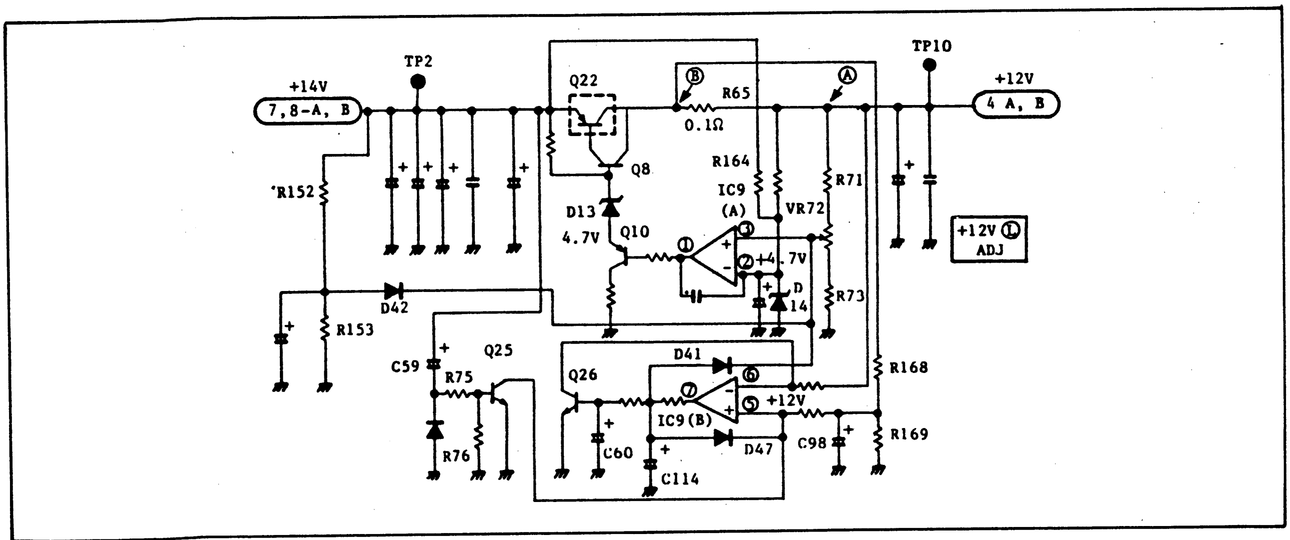


Fig. 4-6 +12V Regulator Circuit

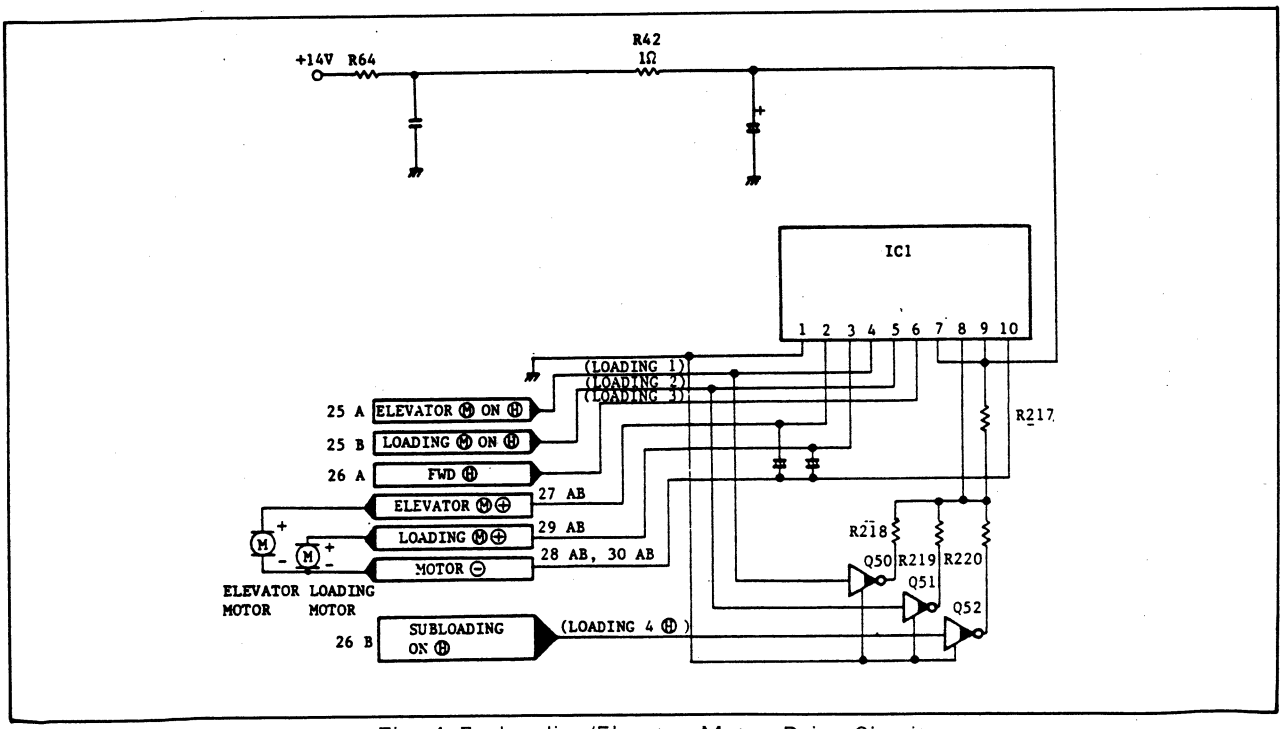


Fig. 4-7 Loading/Elevator Motor Drive Circuit

PIN NUMBER / MODE	INPUT			OUTPUT	
	F. LOADING (M) ON (H)	FWD (H)	F. LOADING (M) ON (H)	MOTOR (+)	MOTOR (−)
	PIN 5	PIN 6	PIN 4	PIN 3	PIN 10
LOADING	H	H	L	H	L
UNLOADING	H	L	L	L	H
BRAKE	L	L	L	L	L

Fig. 4–8 IC1 Loading Motor I/O Signal chart

PIN NUMBER / MODE	INPUT			OUTPUT	
	F. LOADING (M) ON (H)	FWD (H)	LOADING (M) ON (H)	MOTOR (+)	MOTOR (−)
	PIN 4	PIN 6	PIN 5	PIN 2	PIN 10
DOWN WARD	H	H	L	H	L
UP WARD	H	L	L	L	H
BRAKE	L	L	L	L	L

Fig. 4–9 IC1 Elevator Motor I/O Signal chart

4–10. MOTOR DRIVE

IC1 is used to drive both the loading motor and elevator loading motor. Direction (FWD/REV) and speed of the motors is controlled by pins 6 and 8. Pin 6 is used for direction FWD (H) REV (L) and pin 8 controls motor speed according to the input voltage. Inputs and outputs of IC1 for each mode is shown in figures 4–8 and 4–9.
When the elevator loading motor is on, Q50 is also turned on by the elevator loading motor on (H) signal, from the system control. Pin 8 of IC1 controls the motor drive voltage and is set to approximately 10.2V using R218 through Q50. Elevator loading motor speed is kept constant during both loading and unloading operations by R218, through Q50.

Refer to figure 4–7. When the loading motor is first engaged, a subloading mode is started by three signals from system control. A forward (H) sent to pin 6 of IC1, loading motor on (H) sent to pin 5 and to Q51 and subloading (H) sent to Q52. Pin 8 is held to about 6.1V through R219 and R220. When subloading is finished, Q52 is turned off and pin 8 rises to about 9.2V. By controlling the voltage at pin 8, the loading speed is made slow during subloading and high for main loading.

During the unloading operation, Q51 and Q52 are first turned on for 0.5 seconds, after which Q52 is turned off. This causes unloading to start off slow and then switch to high speed. At the subloading point, Q52 is turned back on and the speed is again reduced until unloading is completed.

The small cassette reel elevator motor is controlled in a similar way by IC3. Speed control (pin 8) is fixed by R240 and 241. Inputs and outputs for each mode are shown in figures 4–10 and 4–11.

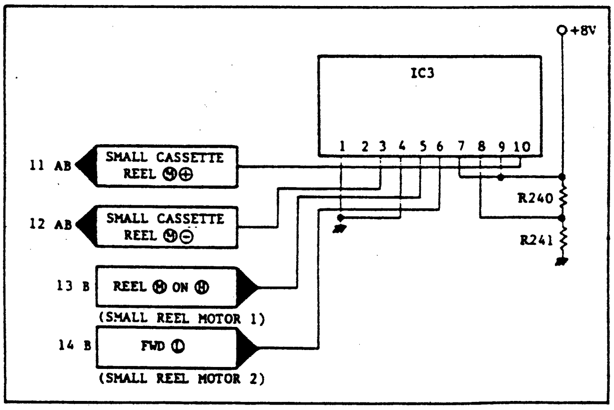


Fig. 4–10 Small Cassette Reel Motor Drive Circuit

PIN NUMBER / MODE	INPUT		OUTPUT	
	MOTOR ON (H)	FWD (L)	MOTOR (+)	MOTOR (−)
	PIN 5	PIN 6	PIN 10	PIN 3
UP WARD	H	H	L	H
DOWN WARD	H	L	H	L

Fig. 4–11 IC3 Small Cassette Reel Motor I/O Signal Chart

4–11. SOLENOID DRIVE

Four solenoids are used in this deck. They are the pinch roller solenoid, loading lock solenoid and the take up and supply reel brake solenoids. The drive circuitry for each solenoid is identical, therefore only the pinch roller solenoid will be described.

Refer to figure 4–12. The pinch roller on (H) signal from system control is sent to Q30 through connector 17B. Q30 inverts this signal and momentarily turns on Q18 by the charging action of C40. The high signal at the collector of Q18 is now sent to pin 6 of IC4. This turns on the internal transistors causing output pin 7 to go low. This will cause current to flow through the pull–in winding of the solenoid. After the solenoid is pulled in, much less current is needed to hold it engaged. This is accomplished by the hold in circuit Q17 and IC2. The low signal from Q30 turns on Q17 which supplies a high to pin 3 of IC2, IC2's output (pin 14) becomes low. And current now flows through the series connected pull–in and hold–in windings of the solenoid.

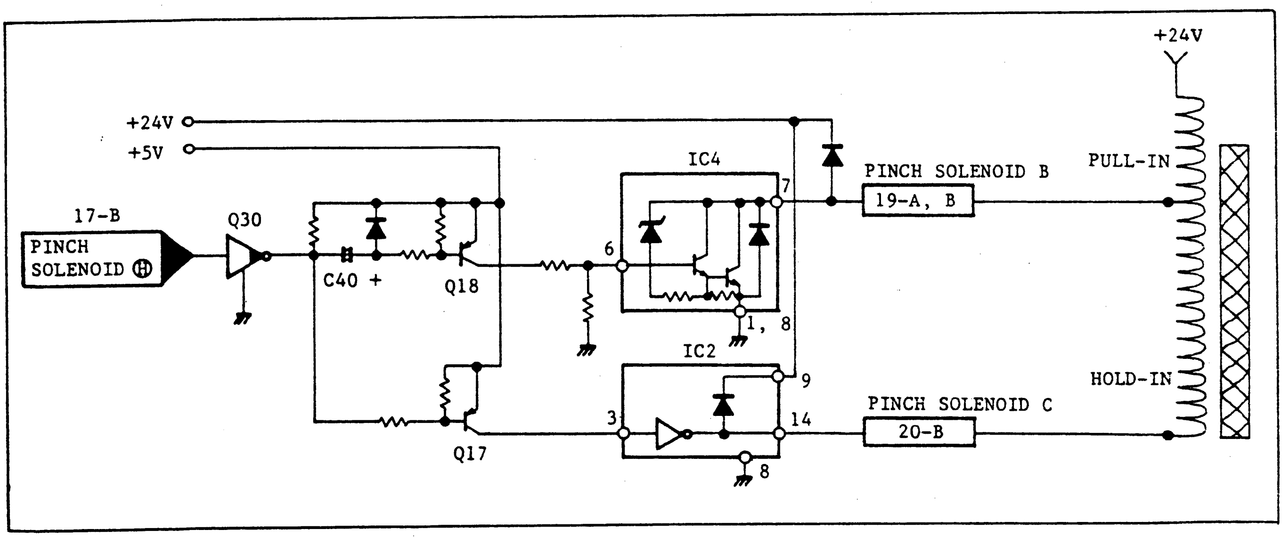


Fig. 4–12 Solenoid Drive Circuit

5. SERVO SYSTEMS

REEL SERVO

5–1. GENERAL DESCRIPTION

This P.C. board contains circuits to control the speed and tension of the take–up and supply reel in each mode (play, shuttle etc.). The control system is shown in the chart below.

Mode		Control method: Supply side	Control method: Take up side	Pinch sol
Shuttle	REV search (-8 - -32)	Speed control	Tension control (15g)	OFF
	REV (-1/32 - -4)	Tension control (30g)	Tension control (25g)	ON
	Still	Tension control (30g)	Tension control	ON
	FWD (1/32 - x 4)	Tension control (30g)	Tension control (40g)	ON
	FWD search (x8 - x32)	Tension control (20g)	Speed control	OFF
Stop		Tension control (30g)	DC control (mechanical brake)	OFF
Play		Tension control (30g)	Tension control (40g)	ON
Loading		DC control (mechanical brake)	DC control (Variable through 4 steps depending on winding radius)	OFF
Unloading		DC control (mechanical brake)	DC control (Variable through 3 steps depending on winding radius)	OFF

Fig. 5–1 Control Mode Table

In modes, except (X8) + (X32), speed control is accomplished by capstan servo, and tension control is accomplished by reel servo. During (X8) + (X32) modes, both tension and speed control are accomplished by reel servo, during (X8) and (X32) the pinch roller is disengaged.

Tension control is performed by electrically detecting movement of the tension arm via a magnetic sensor mounted on the arm (both take–up and supply side). Speed control is performed by detecting signals generated by the FG counted on the timer roller.

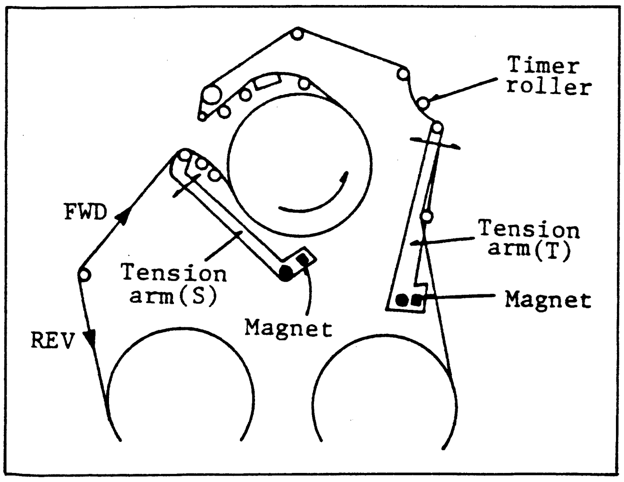


Fig. 5–2 Tension Control System

DETAILED DESCRIPTION

As can be seen in the following block diagram, this circuit can be roughly divided as follows.

1. Take up/supply Reel Tension Control
2. Take up/supply Reel Speed Control
3. Tension/speed control

Next each circuit will be explained.

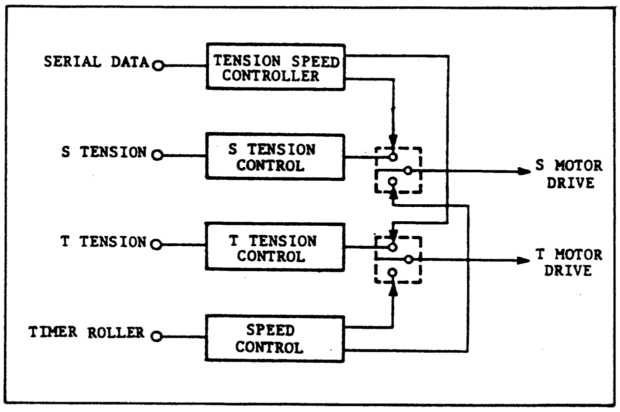
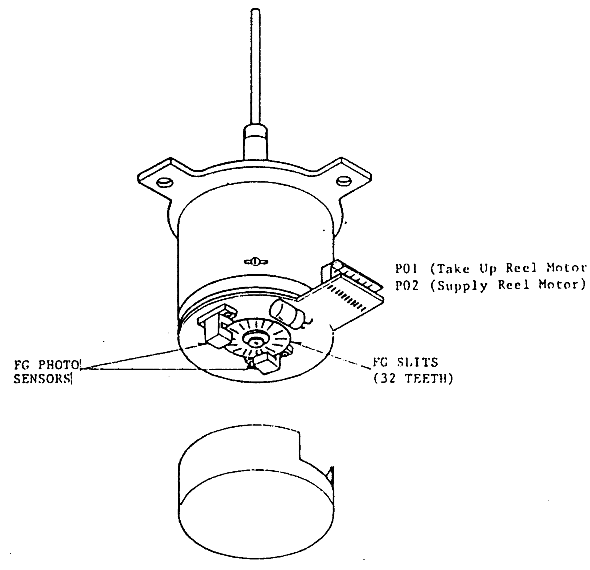


Fig. 5–3 Over All Block Diagram



	P01
1	T PH1 (Take Up Reel Photo Sensor 1)
2	NOT USED
3	+5V
4	T TH (Take Up Reel Thermister)
5	GND
6	T PH2 (Take Up Reel Photo Sensor 2)
7	REEL POWER
8	T REEL M -

	P02
1	S PH1 (Supply Reel Photo Sensor 1)
2	NOT USED
3	+5V
4	S TH (Supply Reel Thermister)
5	GND
6	S PH2 (Supply Reel Photo Sensor 2)
7	S REEL M -
8	REEL POWER

Fig. 5–3 (b) Reel Motor Construction

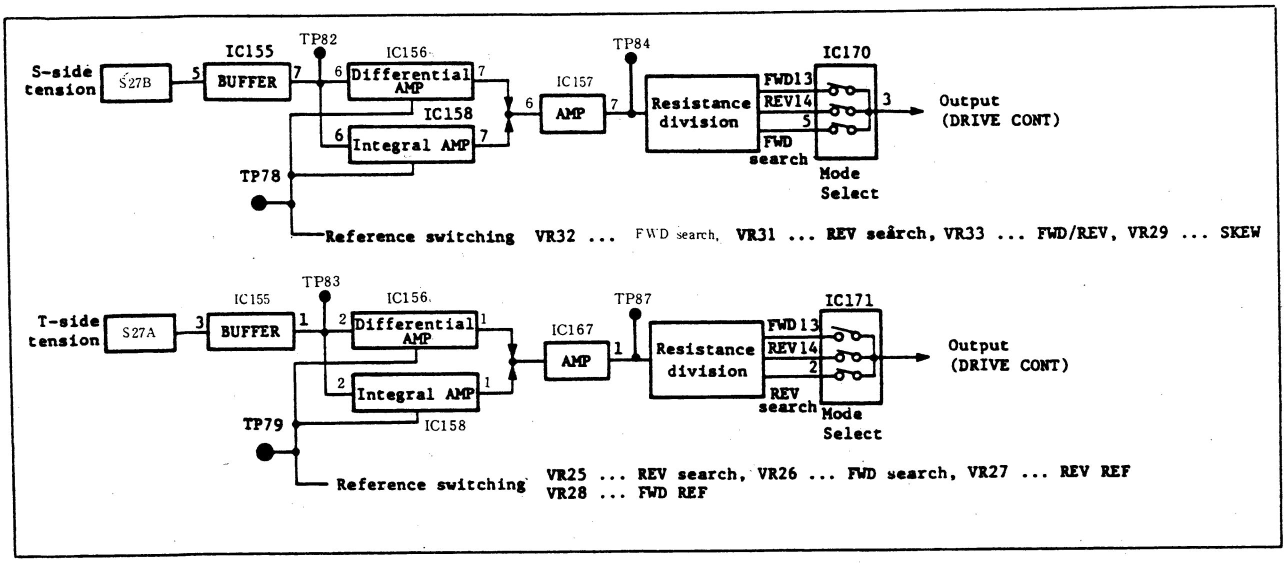


Fig. 5–4 Tension Control Simplified Block Diagram

5–2. TENSION CONTROL

This circuit handles both supply and take–up tension control, but both circuits are almost identical, and we will explain only the take–up tension control circuit. Refer to the simplified block diagram shown in figure 5–4. Output (DC component) from a magnetic sensor is sent to a differential / integral circuit. The purpose of the differential amp is to prevent oscillation of the circuit due to loop gain. The purpose of the integral amp is to improve transition, characteristics and response during speed changes.

The output of a differential and integral AMP is mixed and sent to the motor drive circuit after resistance division. The purpose of resistance division is to change the voltage appropriate to each mode.

5–3. DIFFERENTIAL/INTEGRAL AMP CIRCUIT (TAKE UP TENSION)

As can be seen in figure 5–6, voltage detected by a magnetic sensor is supplied to connector S27A passes through buffer IC155, and is sent to the differential/integral amp circuit. IC156 forms the differential amp and the integral amp. The differential amp circuit is utilizing its frequency characteristics to prevent oscillation, and also prevent noise. The integral amp is used to improve transition and response.

During high speed SEARCH (X8, X32), the entire loop gain is increased. To compensate for this the SEARCH (H) signal lowers the gain of the differential/integral amp. The tension value varies depending on the tape pack diameter. It is detected, and the gain of the amp is adjusted.
Tape pack detection is accomplished by comparing the frequency of the timer roller and reel FG's.
This is done in the system control circuit. There are 3 possible conditions of pack diameter detector: small (13–23mm), medium (23–33mm) and large (33mm–).

Reel response must be increased at the transition's of brake on, pinch roller on or direction reversal.
This is done by momentarily muting the integral circuit via IC162. The off period is determined by the time constants of C200 and R265, in conjunction with IC151.

As can be seen in figure 5–1 of the general description the tension value differs during FWD and REVERSE, and therefore must be switched. VR28 (T FWD), VR27 (T REV), and VR25 (T.R. SEARCH) set each tension. IC154 is used for switching and controlled by a mode select signal, as shown in the chart below.

Control input			"ON" channel
INHIBIT	B	A	IC154(MC14052BF)
L	L	L	Y0, X0
L	L	H	Y1, X1
L	H	L	Y2, X2
L	H	H	Y3, X3

B = SEARCH Ⓗ
A = REV Ⓗ

Fig. 5–5 IC154 Table

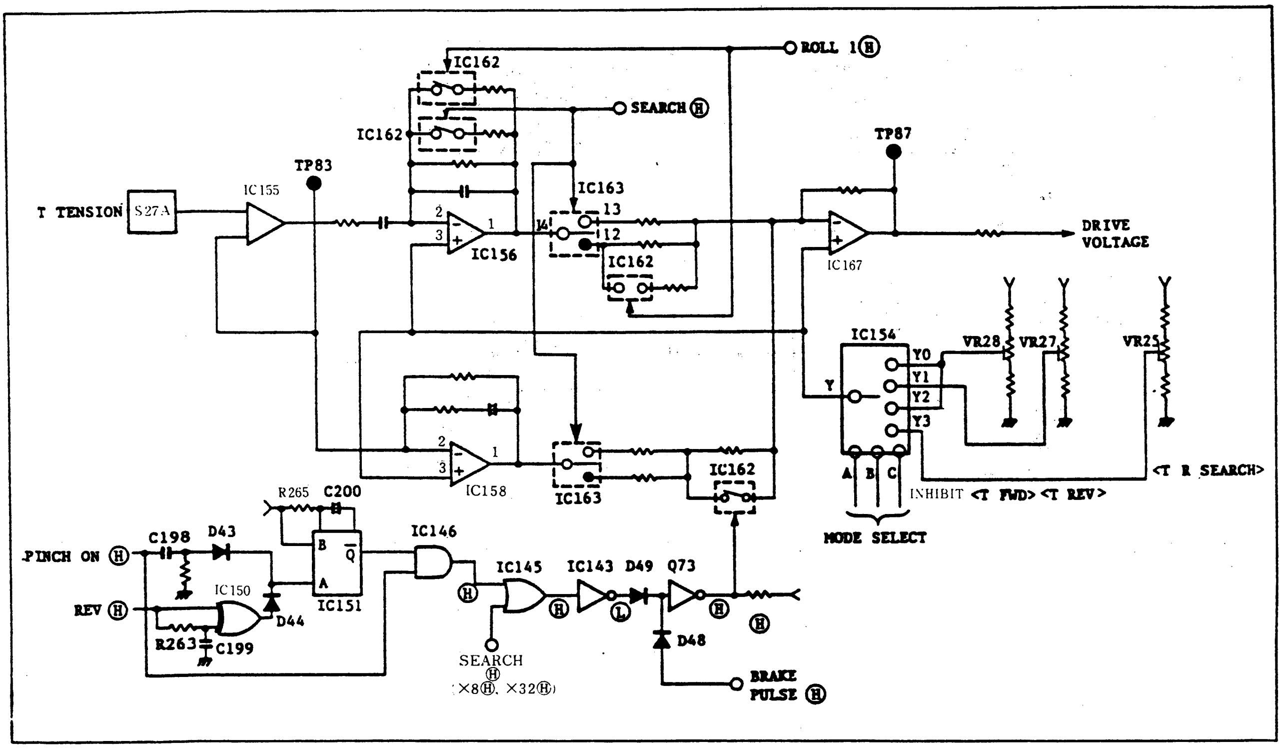


Fig. 5–6 Differential/Integral Amp Circuit

5–4. MODE SWITCHING CIRCUIT

This circuit switches differential/integral circuit output voltage, speed control circuit output voltage and voltage during loading/unloading.
Refer to figure 5–7. The output voltage of the differential/integral amp circuit is resistance divided and sent to X(0), X(1) and X(6) of IC171. The X(0) is resistance divided at R356 and R357 and used during FORWARD mode. The X(1) is resistance divided at R358 and R359 and used during REVERSE.
The X(6) is resistance divided at R360 and R361 and used during REVERSE SEARCH. Output of the speed control circuit is sent to X(5), and used during FORWARD SEARCH.
The X(3) is used during loading, but loading is divided into 2 periods: sub–loading (slow speed loading) and normal loading (high speed loading). Normal loading voltage is determined by VR34 and sub–loading voltage by VR34 and R294.

The voltage must also be varied depending on tape pack diameter. Voltage is determined by R295 when the tape pack diameter is small and by R296 during medium tape pack. During loading, the position of the tension arm and its magnetic sensor output voltage are irregular, causing tension to be unstable. Therefore the circuits IC147, Q72 and D47 have been incorporated to preset the voltage for a fixed time period during loading. This period is determined by IC147, R313 and C212.

Similarly, input (X4) is used during unloading, and the voltage is switched depending on the tape pack diameter. Voltage is set by R298 at small diameter condition, R297 at medium pack diameter, and VR35 at large pack diameter. When the beginning or end of the tape is detected (CLEAR LEADER detection) at cassette insertion, a short FF or REW is performed.
This is done to prevent head damage by leader tape contacting the head assembly.

During short FF/REW, input (X7) is utilized to initiate a reduction in reel drive voltage. After the short FF/REW mode is engaged, IC148, IC151, Q53 and R259 reduce the drive voltage to the This in turn will slow down the tape movement before loading in engaged. This assures proper tape handling.

	IC144			IC171
	Q0	Q1	Q2	X
REV (L)(FWD(H))	L	L	L	X0
REV (H)	H	L	L	X1
GND	L	H	L	X2
Loading (H)	H	H	L	X3
Unloading (H)	L	L	H	X4
F search (H)	H	L	H	X5
R search (H)	L	H	H	X6
S. FF/REW (H)	H	H	H	X7

Fig. 5-7 IC144 Table

5-5. SPEED CONTROL CIRCUIT

This circuit is essentially a digital speed comparator. FG input from the tape counter roller is made into a 50/50 duty cycle (square wave) form, by IC182 on the Reel Sub 2 board. It is then amplified by IC152 and applied to the comparison input of IC169.

Inside of IC169 the FG pulses are compares against the divided down 3.58MHz signal from the decoder boards. The output of the digital comparator is applied to a pulse width modulator inside IC169. When the tape speed is correct the pulse width modulator output will be a 50/50 duty cycle square wave. This square wave output is then converted to a DC component by a low pass filter, composed of R401, R402, R403, C235 and C236.

The DC converted signal is sent to an amp (IC166). The gain of this amp is switched due to the difference in load between FWD and REVERSE. The gain is also switched because of the difference in inertia due to the tape pack diameter. This gain switching is performed by IC168. R396 and IC163 change the amp output gain to assure smooth entry into SEARCH MODE.

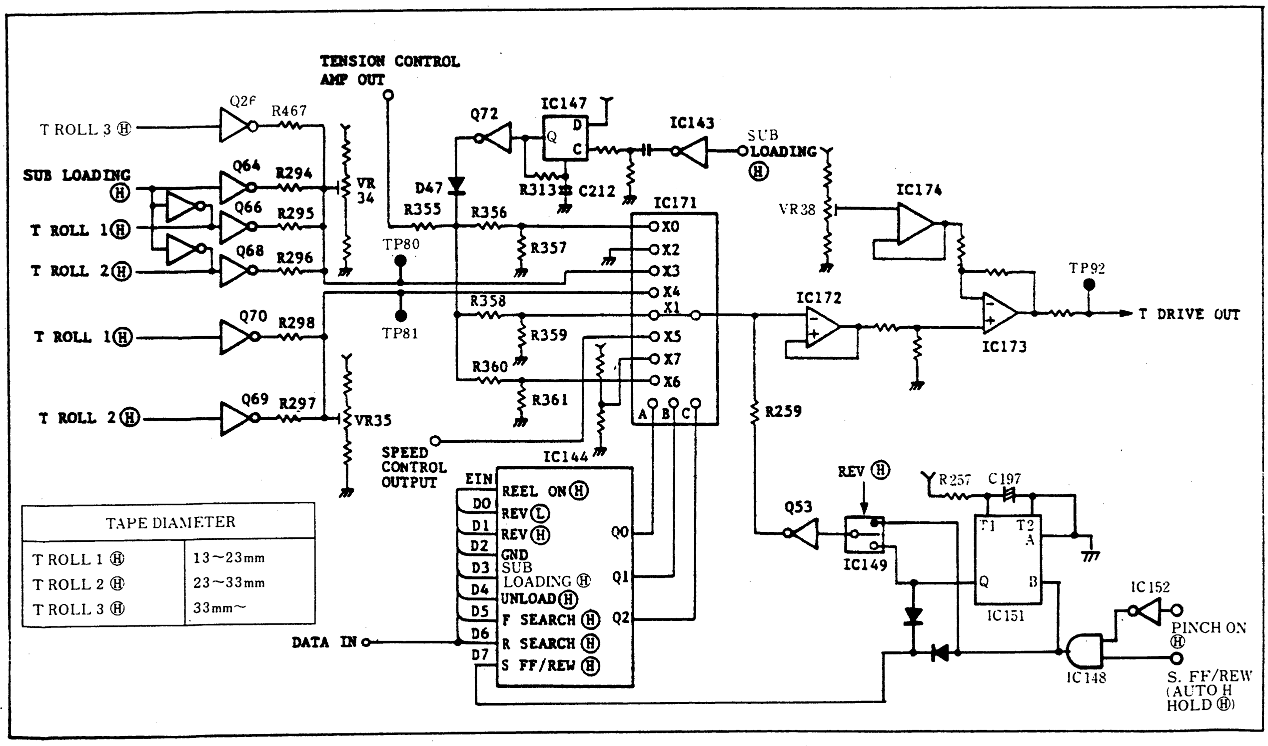


Fig. 5-8 Mode Switch Circuit

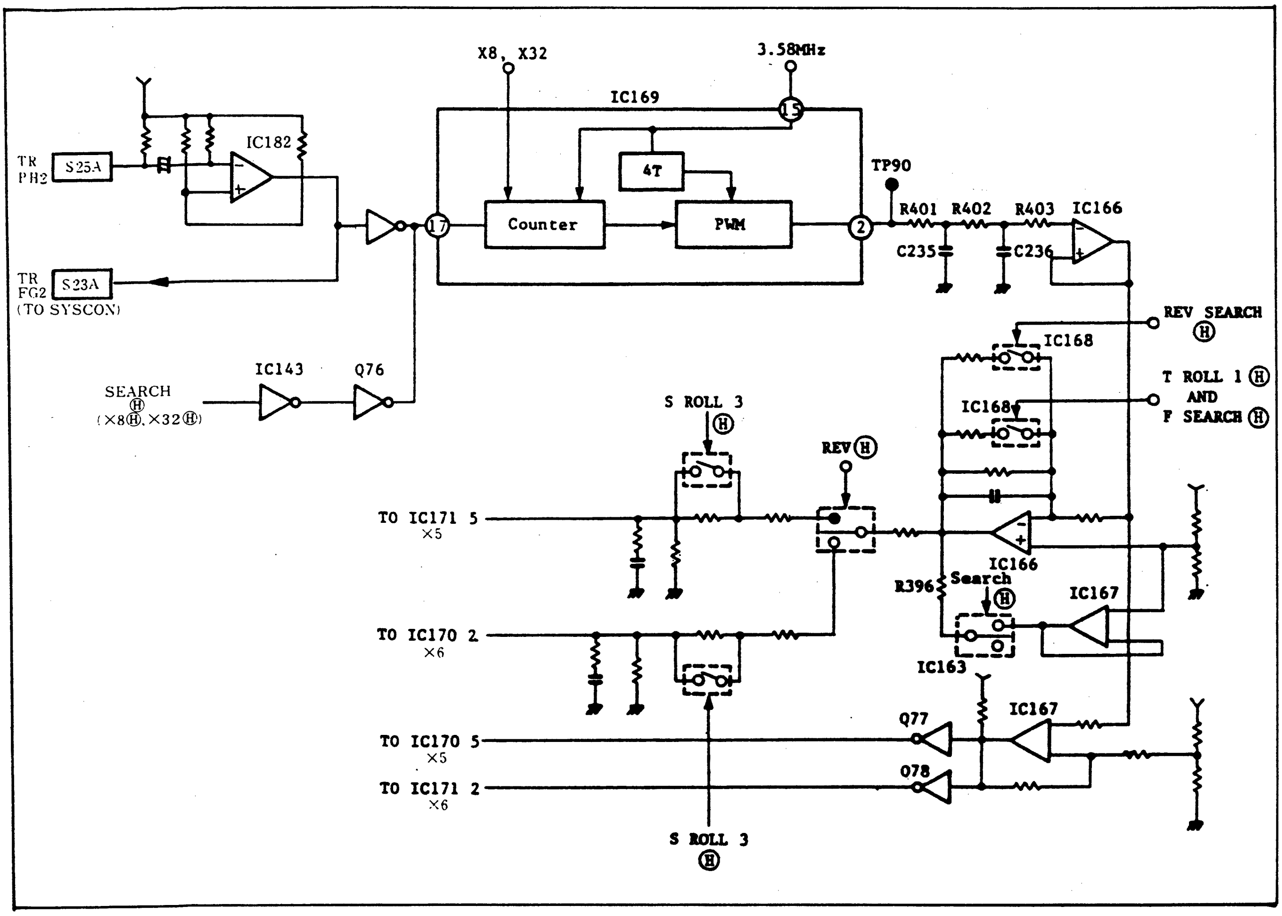


Fig. 5–9 Speed Control

5–6. TAPE SLACK DETECTION CIRCUIT

This circuit detects abnormal tension (tape slack) in the modes. The take–up side and supply side have identical circuits. The take–up side will be explained only. Refer to figure 5–10. The circuit operates when either take–up or supply motor error voltage deviates from the fixed voltage range (upper and lower limits). This is sensed as a tension abnormality. This information is sent to the micro–processor which in turn stops the deck.

The upper limit voltage is set by R386, R387 and VR37, and the lower limit voltage by R391 and R392. During FWD SEARCH, the take–up side controls speed and the supply side controls tension. Therefore a search (H) signal is sent to IC145. This, in turn, enables the supply tape slack signal to be gated through IC148. The opposite is true for reverse search.

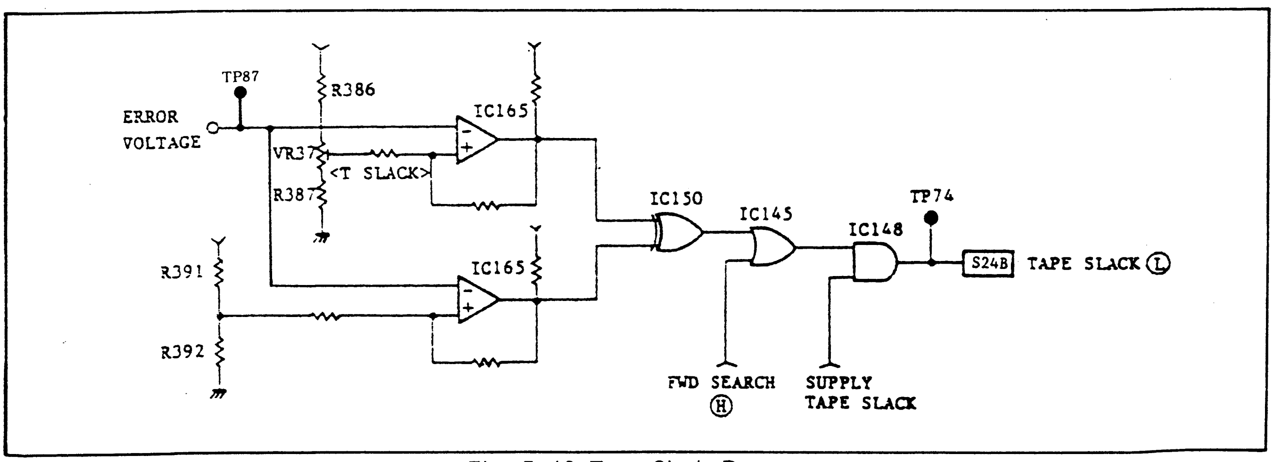


Fig. 5–10 Tape Slack Detect

CAPSTAN SERVO

GENERAL DESCRIPTION

The capstan servo circuit controls tape travel and has the following features:

1. Drives the capstan directly at speeds from X4 to X1/32.
2. Performs variable speed control from X64/32 to X1/32 via a linear slow circuit.
3. Changes tape travel quickly in response to mode changes.
4. Because it is a digital servo circuit, it is stable, reliable, and easy to adjust.

Figure 5–10 shows a block diagram of the capstan servo.

The capstan servo circuit is comprised of circuits centered around a digital servo control IC.

The two principal purposes of the capstan servo are:

1. To perform precise servo lock based on external and internal reference signals.
2. To perform gentle but rapid changes in tape travel.

To achieve the former, a digital servo circuit is used. Unlike conventional analog systems which detect speed and phase differences as the differences in sampling voltages of trapezoidal waves, this digital system detects differences in time. This type of system eliminates the need for capacitors for making trapezoidal waves or for sampling, has superior stability, offers consistent performance, and uses fewer VR's for easier adjustment. To achieve the latter, it performs mode changes with precise switching timing. This switching timing is determined by detecting the rotation of the capstan motor through monitoring of the FG frequency. This system makes it possible to change the speed of the capstan motor quickly and gently.

5–7. SPEED CONTROL

This circuit controls the speed of the capstan from X4 to X1/32. In order to sample the PG signal at a fixed frequency and detect time differences in the digital servo circuit, the FG signal, which changes with the mode, is divided or multiplied to give it a certain frequency. Control is performed to keep this frequency constant. A pulse width modulated (PWM) pulse is output as an error signal, DC converted by a filter, and mixed with the error output of the phase control system. In variable speed control, the reference clock of the digital servo circuit is changed and more precise speed control than that explained above is performed.

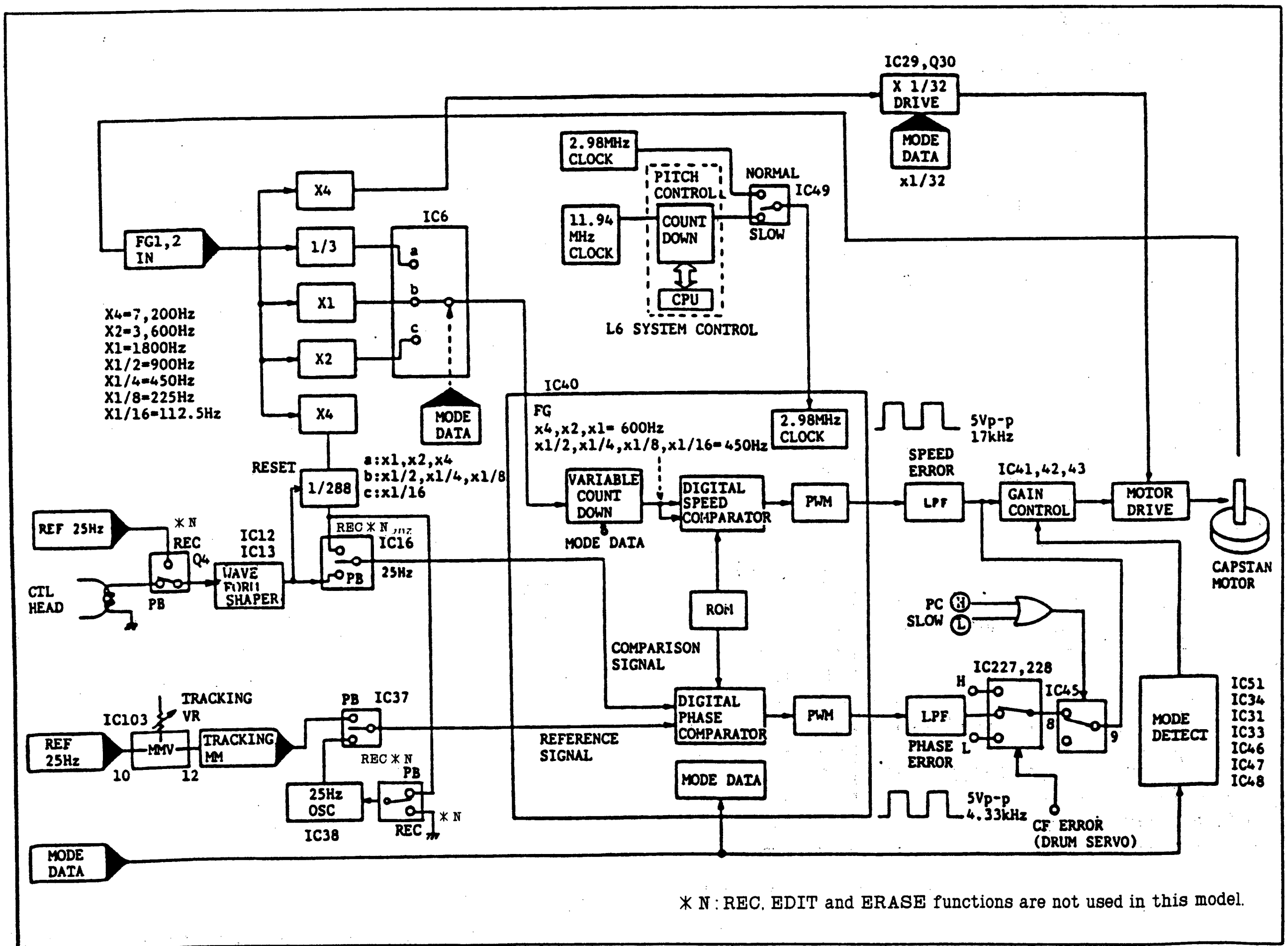


Fig. 5–10 Capstan Servo Block Diagram

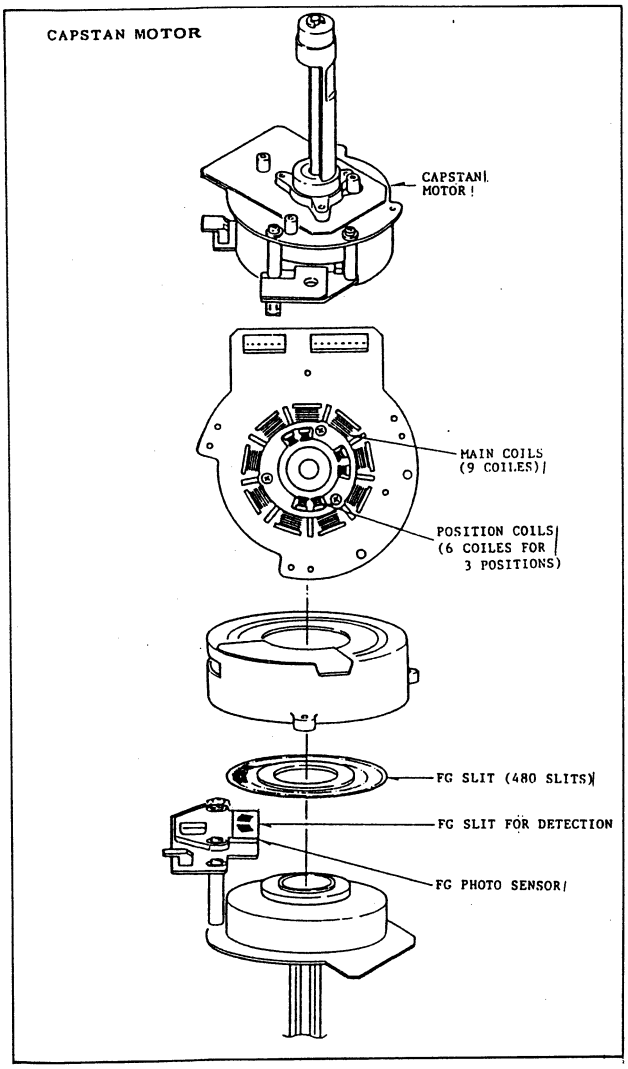


Fig. 5–10 (b) Capstan Motor Construction

5–8. PHASE CONTROL

Phase control is performed by using the type of reference signal and comparison signal shown below.

MODE	REFERENCE	COMPARISON	
REC	25Hz INTERNAL OSC	FG SIGNAL	⋇N
PB	25Hz LOCKED REF	CTL SIGNAL	
ASSY	25Hz LOCKED INPUT VIDEO	CTL SIGNAL	⋇N
	25Hz INTERNAL OSC ※	FG SIGNAL	⋇N
INS	25Hz LOCKED INPUT VIDEO	CTL SIGNAL	⋇N
	25Hz LOCKED INPUT VIDEO	CTL SIGNAL	⋇N
TC/INS	25Hz LOCKED REF	CTL SIGNAL	⋇N

※ Internal oscillator is syncronized with the input video signal prerecoded mode.

Fig. 5–11 Phase Control

The purpose of phase control is to lock the phase of the capstan with respect to the reference signal. Phase control is extremely important in the editing, AT playback and search modes. In normal recording, the internal 25Hz signal and a 25Hz signal divided from the capstan FG signal are synchronized, but in the INSERT mode, the CTL signal remains unchanged, and so synchronization is obtained by resetting division of the FG signal by means of the input video signal and the CTL signal.

When a regular CTL circuit is used during the T/C INSERT mode, there is a possibility of T/C crosstalk, so the threshold level is increased to mask any TC leak in CTL. In the 1/32 slow mode, the capstan FG signal is fed back so as to drive the capstan at a constant speed. The 1/32 slow mode is realized by decreasing the on time of the motor from that in the 1/16 slow mode.

5–9. MODE DETECTOR

To realize the other purpose of the capstan servo, that is quick, gentle speed changes, it operates mode switches precisely and with the correct timing.

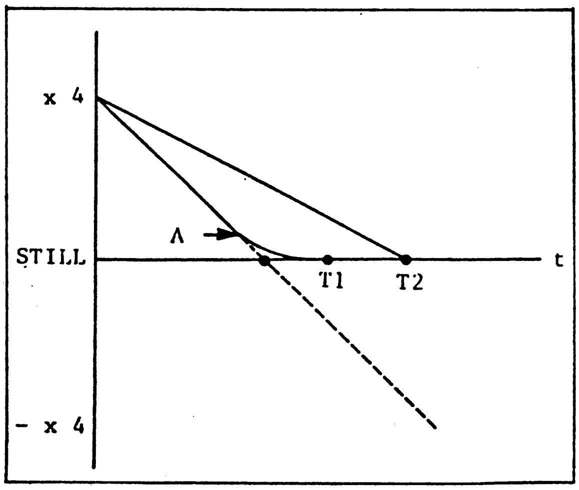


Fig. 5–12 Speed Control

Let's look at switching from X4 search to the still mode for example. When switching directly from X4 search to the still mode, the gain of the circuitry also drops and time T2 is required to perform the switch, but by sending a REV signal to the motor until the tape speed slows down, the motor is reversed while keeping the gain of the circuitry high. When the speed drops to (A), the mode switches to the still mode. This makes it possible to switch to the still mode in the shorter time T1. Speed (A) is detected by monitoring the intervals of the FG pulses from the capstan motor via a MMV IC.

⋇N: REC. EDIT and ERASE functions are not used in this model.

DETAILED DESCRIPTION

5-10. SPEED CONTROL

TAPE DIRECTION DETECTOR

The FG signal is made from the FG1 and FG2. The phases of these two signals differ by 90 degrees. Both signals are amplified in amplifier IC1 (TP4, TP5), and the outputs are supplied to IC2 and IC3. In IC2 D type flip-flop, the forward or reverse tape direction is detected from the 90degrees phase difference of FG1 and FG2. In FWD the output (TP6) of IC2 becomes low, and in REV the input phase reverses, and the Q output becomes high. (Figure 5-13, Figure 5-14)

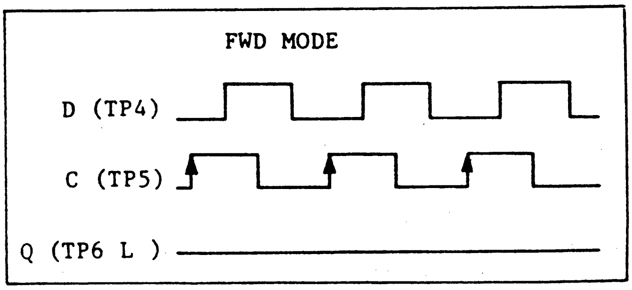


Fig. 5-13 Tape Direction Detector

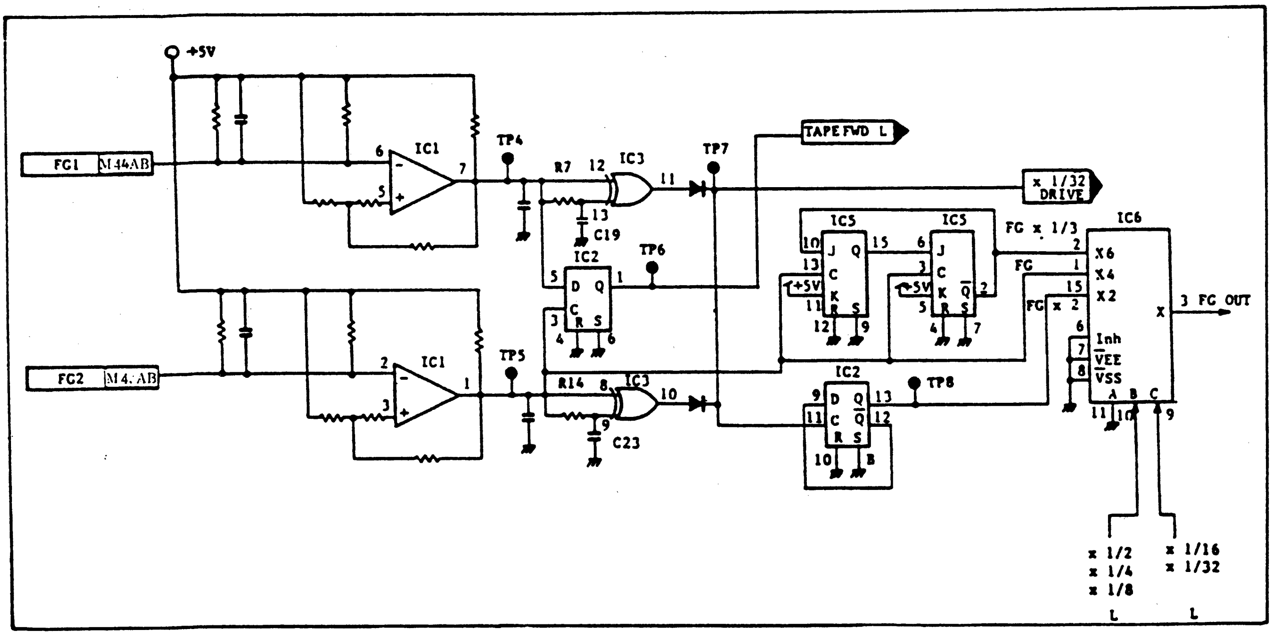


Fig. 5-14 FG Count Down Circuit

5-11. FG COUNT DOWN

The FG1 and FG2 signals are supplied to an exclusive "or" circuit. The FG1 (TP4) signal is input to pin 12 unchanged and to pin 13 after it is slightly delayed by R7 and C19. The output is a doubled FG signal. The FG2 signal is doubled in the same way. In TP7 the FG1 and FG2 signals have a 90-degrees phase difference, thus resulting in a quadrupled FG signal (figure 5-16). this quadrupled FG signal is input to the IC2 D type flip-flop. It is also supplied to the X1/32 slow drive circuit.

The quadruple FG signal is counted down to a double FG signal in the IC2 D type flip-flop. The FG2 signal (TP5) is used to make a one-third FG signal in the IC5 JK type flip-flop.

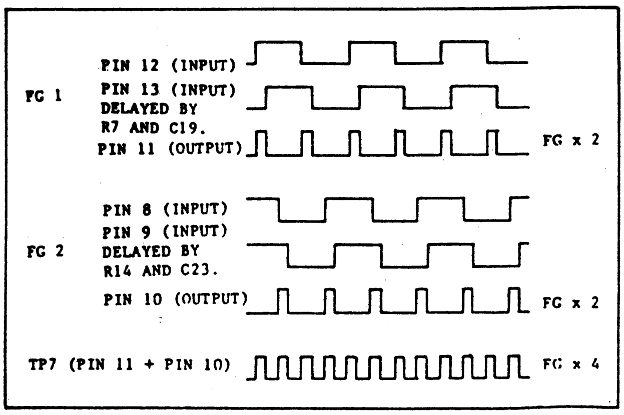


Fig. 5-15 Operation of Exclusive OR Circuit

5-12. FG SIGNAL SELECT CIRCUIT

Three types of signals are input to IC6 through pins 1, 2, and 15 and are used to switch the pin 3 output signal in accordance with the speed mode. This output signal is input to pin 17 of IC40 where it is divided and multiplied depending on the speed mode to make the sampling frequency. This is shown in figure 5-17.

	FG FREQUENCY		INPUT & SAMPLING (IC40)			PIN INPUT (IC40)					
TAPE SPEED	FG FREQUENCY	DIVIDER	IC40 INPUT (IC6 OUTPUT)	DIVIDER	SAMPLING FG	Pin22 VSC0	Pin21 VSC1	Pin20 VSC2	Pin11 MOD1	Pin10 MOD2	Pin13 SLOW
x 4	7200Hz	x 1/3	2400Hz	x 1/4	600Hz	L	L	H	H	H	L
x 2	3600Hz	X 1/3	1200Hz	x 1/2	600Hz	L	H	L	H	H	L
x 1	1800Hz	x 1/3	600Hz	x 1	600Hz	H	L	L	H	H	L
x 1/2	900Hz	x 1	900Hz	x 1/2	450Hz	H	L	L	L	L	L
x 1/4	450Hz	x 1	450Hz	x 1	450Hz	H	L	L	H	L	L
x 1/8	225Hz	x 1	225Hz	x 2	450Hz	H	L	L	H	L	H
x 1/16	112.5Hz	x 2	225Hz	x 2	450Hz	H	L	L	H	L	H

Fig. 5-16 FG Frequency

5-13. SPEED CONTROL CIRCUIT

Speed control is performed by counting the clock signal during the high period of the sampling FG signal (600Hz or 450Hz), made from the FG signal, and comparing the count of the clock signal with the counts stored in ROM, (from the respective modes), thereby keeping the speed constant. If there should be a difference, the error output is converted to a 17.3kHz 5V p-p pulse, by pulse width modulation and then DC converted in a low pass filter (R90, C54), and the resultant voltage is fed back to the motor. For example, if the speed is slower than the prescribed speed (duty 50%-50%), the high period of the PWM duty becomes shorter and the DC voltage becomes lower. If it is faster, the high period of the PWM duty becomes longer and the DC voltage as shown in figures 5-17, 5-18 and 5-19.

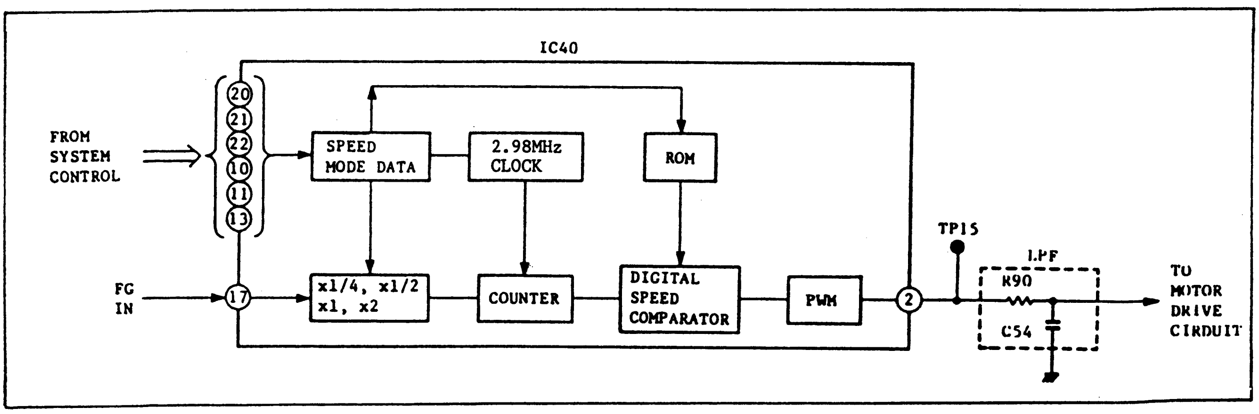


Fig. 5-17 Speed Control Operation

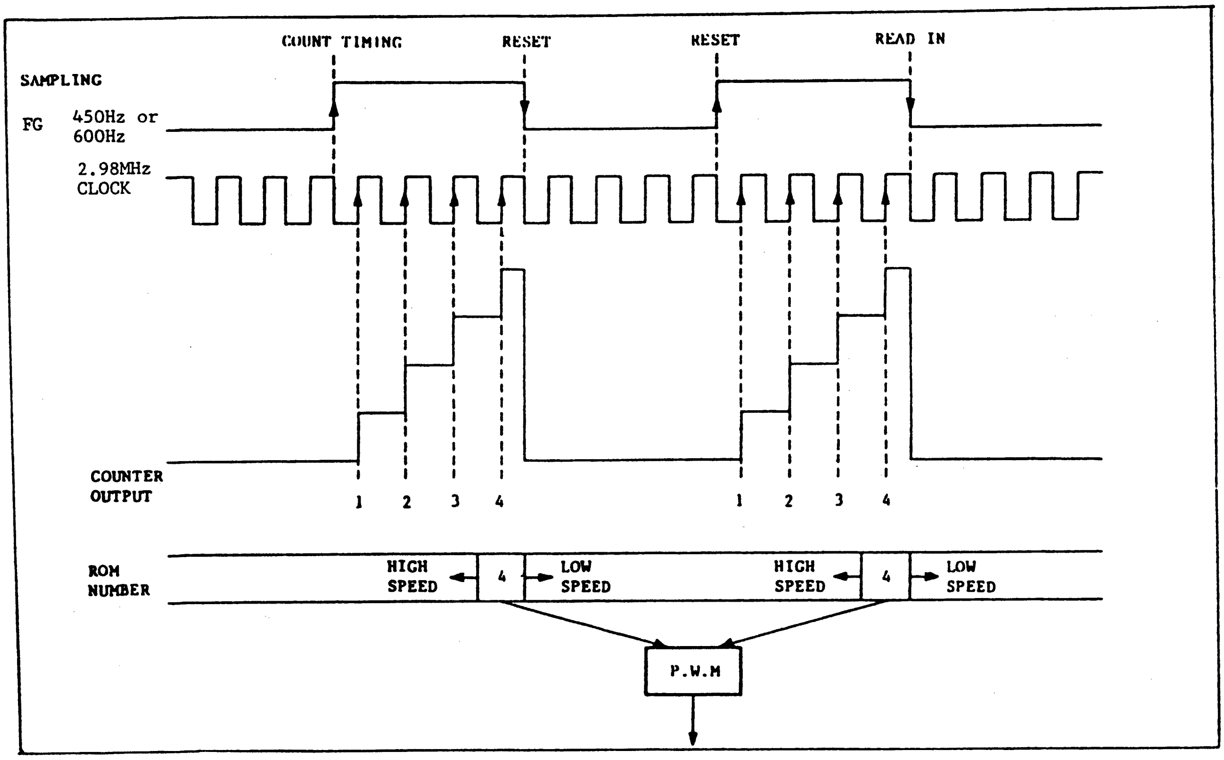


Fig. 5–18 Speed Control Operation

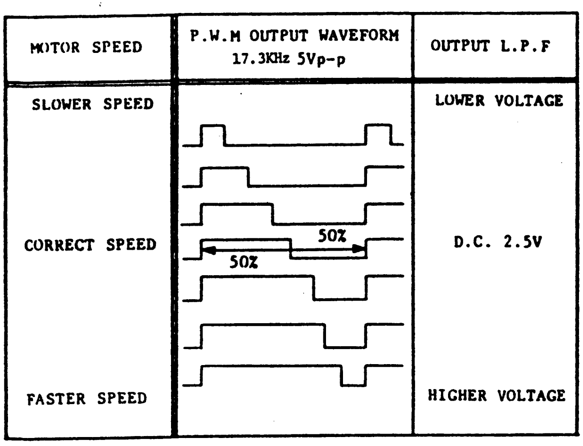


Fig. 5–19 Speed Control

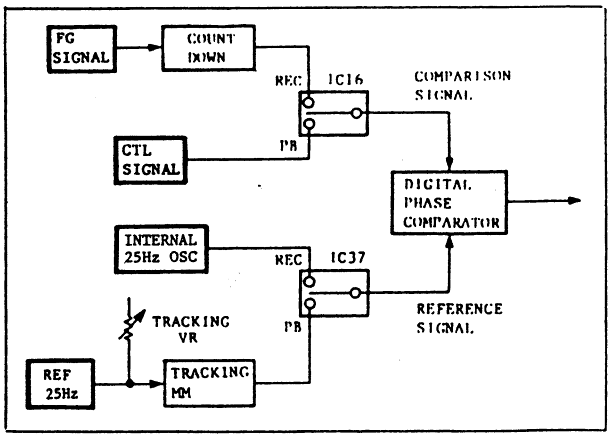


Fig. 5–20 Phase Control Block Diagram

2. Phase Control

In phase control, the reference signal and comparison signal charge as shown in figures 5–20 and 5–21.

5–14. REFERENCE SIGNAL

The reference signal during REC is produced by outputting the 60Hz signal made in IC38 from pin 14, dividing it by two in IC36 (a D–type flip–flop), and sending the resulting 25Hz signal to pin 5 of IC37 (A) (the switching IC). This IC supplies the 25Hz signal made from the tracking MMV signal and internal oscillator in PB and the internal oscillator 25Hz signal selected by the CTL EDIT signal (low) synchronized by the tracking MMV signal (input video signal) in REC to pin 6 of IC40. To achieve synchronization in assemble editing, the count down IC's (IC8, IC9, and IC10) for the FG signal are reset by the PB signal (high) and the CTL signal in IC32, and the counted down FG signal is sent to the internal oscillator IC32 as a reset pulse. In this way, synchronization of the CTL signal and the internal oscillator 25Hz signal is obtained and picture quality is maintained at the editing point. This is illustrated in figure 5–22.

5–15. COMPARISON SIGNAL

In REC, the comparison signal counts down the FG X4 signal to 1/288 in IC8, IC9 and IC10 (preset value hex: 120) to make a 25Hz FG signal. This signal is sent to IC16, where it is selected by a REC signal (low) and then sent to pin 16 of IC40. By sending CT REC (low) to Q4, the REF 25Hz signal is passed through C28, D3, and D4 and sent to the CTL head to record the CTL pulse. In playback, the comparison signal is picked up from the tape by the CTL head, amplified in IC12 and IC13, sent to IC16, selected by the PB signal (high), and sent to pin 16 of IC40. Since noise will occur in the CTL signal when inserting time code, the CTL signal is correctly read by switching the IC14 threshold level via the (L) TC EDIT signal. Please refer to figure 5–23.

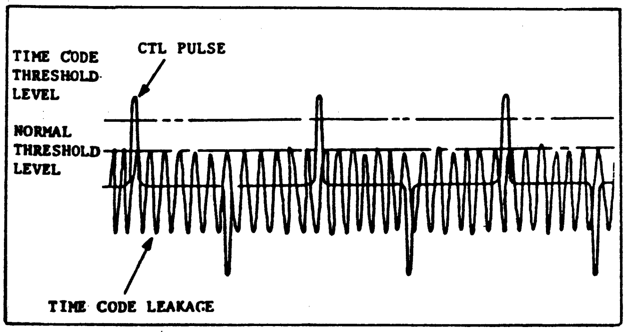


Fig. 5–23 CTL Threshold Level

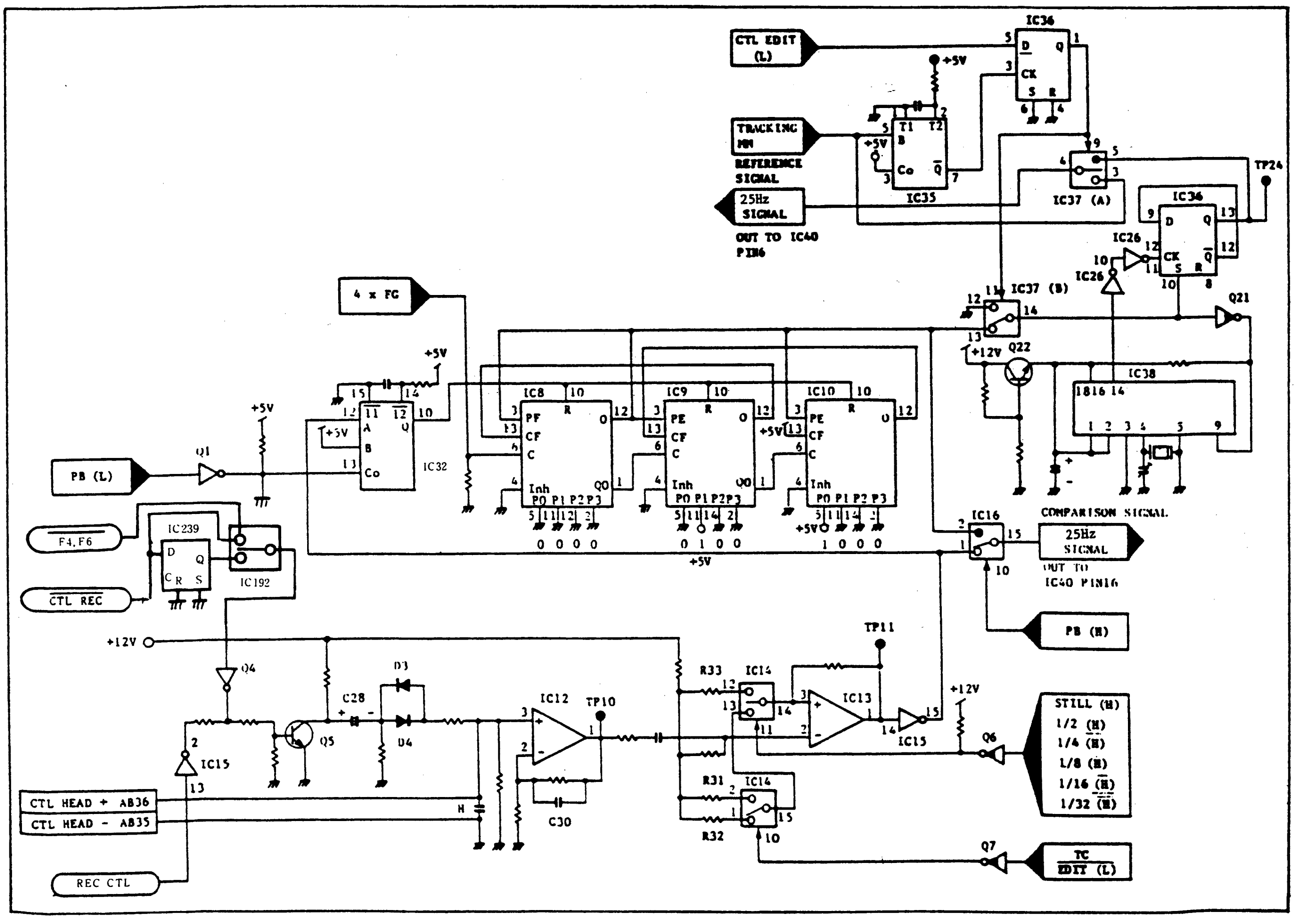


Fig. 5–22 Phase Control Circuit

5-16. PHASE CONTROL CIRCUIT

The relationship between phase control and speed control is shown in figure 5-24.

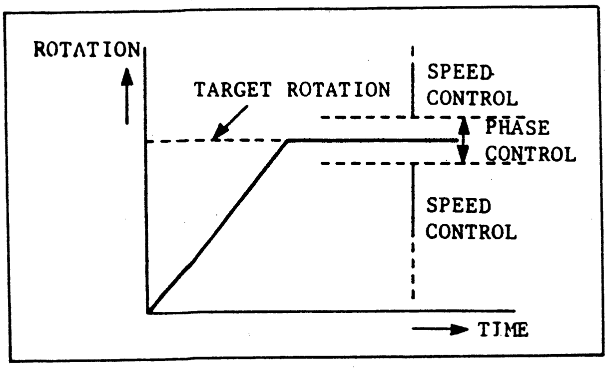


Fig. 5-24 Speed/Phase Control

As shown in the figure, speed control performs rough control to obtain the target rotation. Phase control performs fine control not obtainable with speed control.

In phase control, the reference signal and comparison signal are compared, and control is performed so that their phase difference is zero (0). Next is an explanation of IC40's internal composition.

1. The correct phase difference between the reference signal and the comparison signal for the speed modes sent from the system control circuit are stored in ROM. To simplify the explanation, we will assume the ROM number is 5.

2. The counter begins counting with the rising edge of the reference signal and stops counting with the falling edge of the comparison signal.

3. This counter number and ROM number are compared in the digital phase comparator, and this error output replaces the duty difference by PWM. The ROM number now is 5. and if the counter number is smaller than this, it is judged that the phase is advanced, and so the high period of the duty is lengthened.

4. By converting the PWM output to a DC voltage in the LPF (R94, C55) through a colour framing circuit in the Drum Servo Circuit and feeding it back to the motor, the rotation of the motor is kept constant.

5. However, in the X1/8, X1/16, and X1/32 slow speed modes, phase lock is not performed.

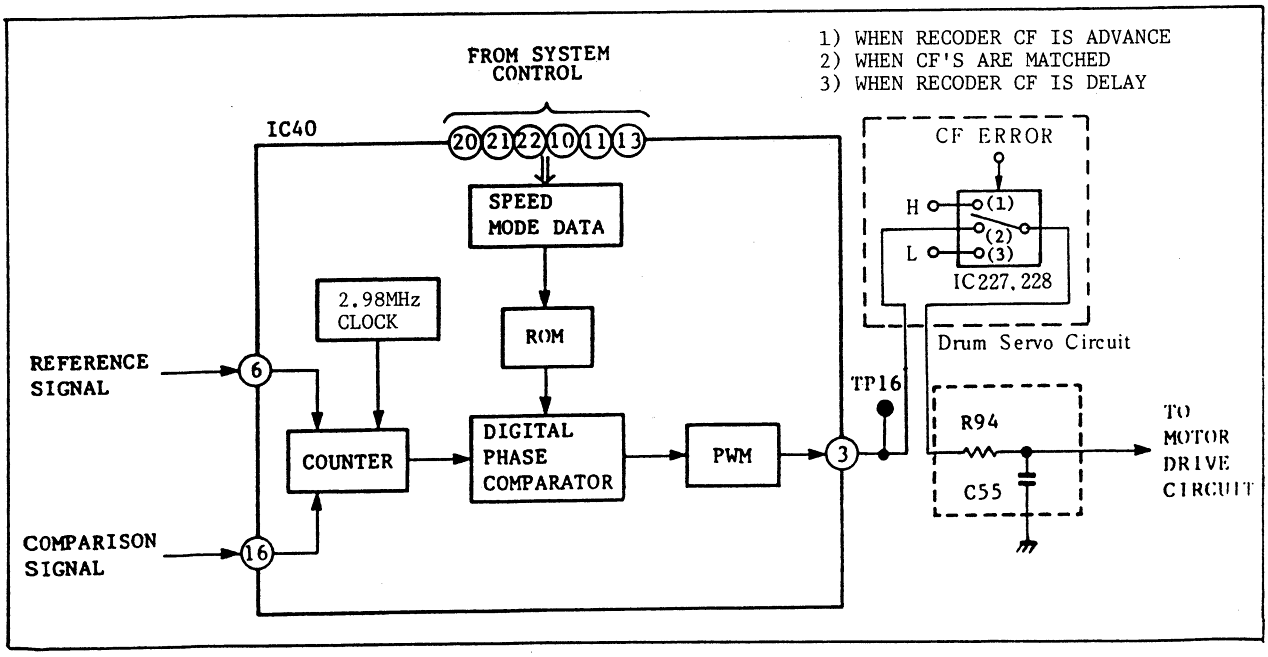


Fig. 5-25 Phase Control Circuit

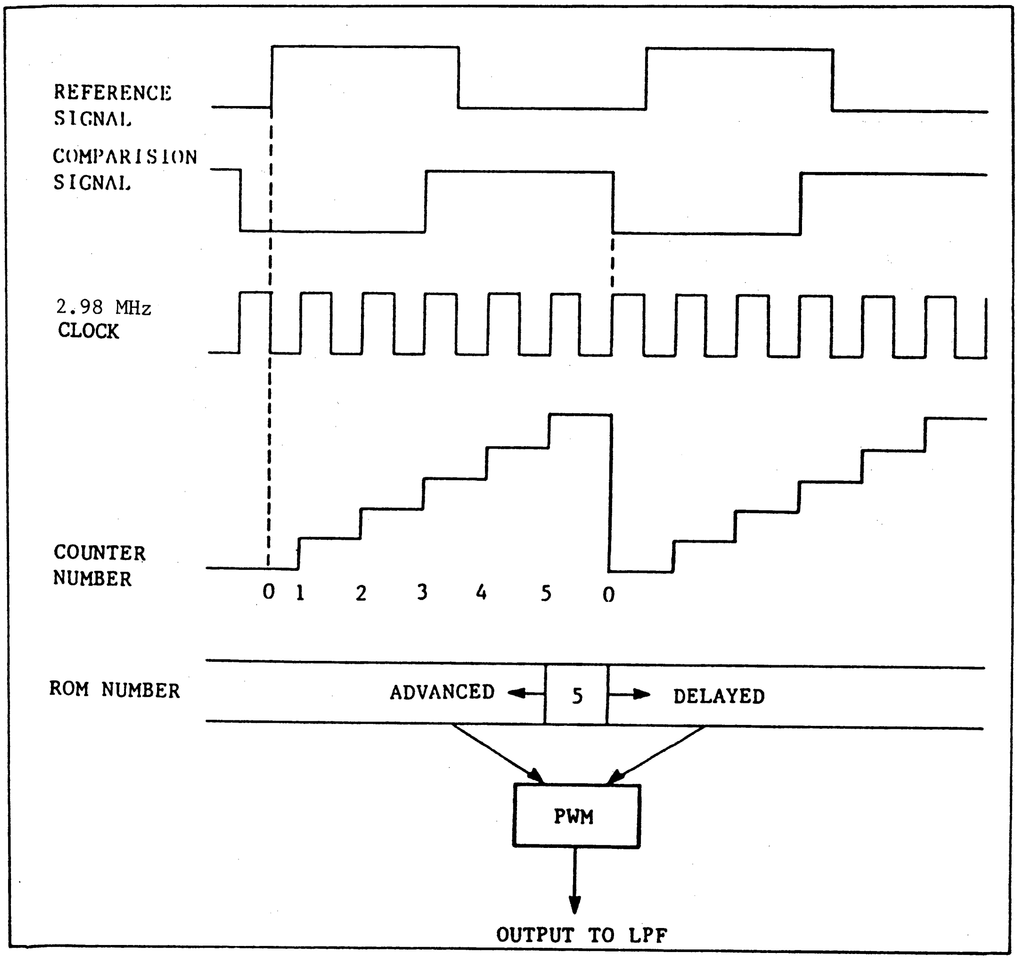


Fig. 5–26 Phase Control Operation

5-17. PHASE LOCK DETECTOR

If the servo lock shifts in the normal speed mode, the SERVO LOCK indicator on the front panel comes off to inform the user of trouble. In playback, IC17 makes a window pulse using the reference 25Hz signal. When a CTL signal enters during this window pulse, IC18 outputs a LOCK signal (low). At speeds other than normal speed, operation of this circuit is disabled by resetting IC18. Please refer to figure 5-27.

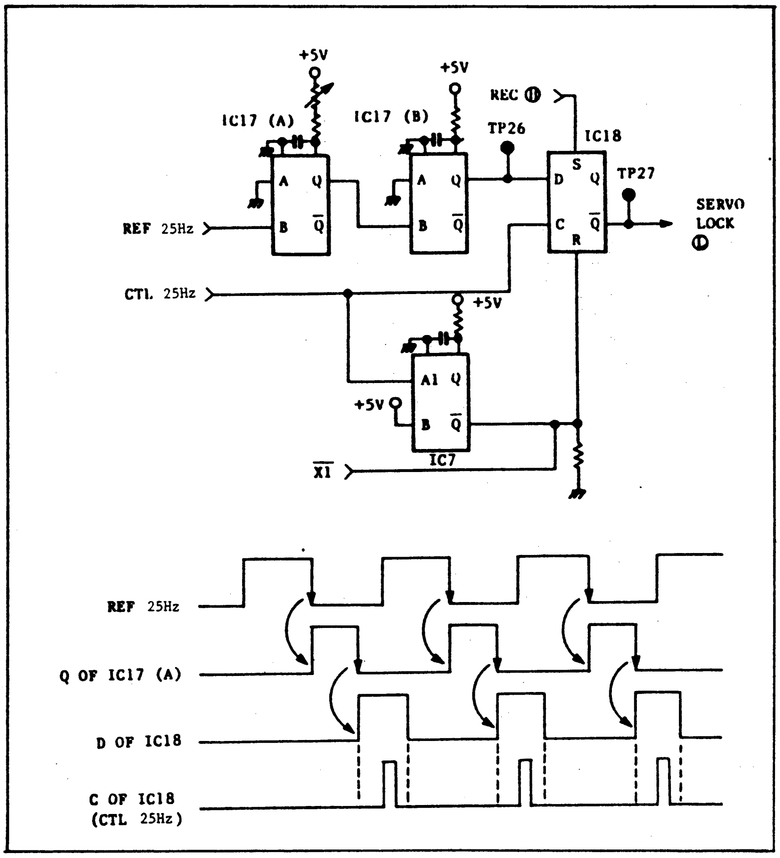


Fig. 5-27 Phase Lock Detector

5–18. X1/32 SLOW SPEED CONTROL

The reference 25Hz signal is divided by 2 in IC18 (D type flip–flop). By using this signal as a reset pulse, the X4 FG signal (figure 5–28 TP21, 270Hz) is shaped into a sawtooth waveform in IC29 (A) (figure 5–28 TP21). This sawtooth waveform is used to make the 50%–50% duty cycle waveform indicated at TP23 in figure 5–28, in IC29 (A) (comparator). However, smooth capstan rotation cannot be obtained with only this. A X4 FG signal is generated in IC30 (MMV). The duty of this signal can be changed by the VR3. By adding this signal (figure 5–28 Q of IC30) and the TP23 signal (figure 5–28) the CAPSTAN ON signal becomes like Q12 in figure 5–28 and smoothes the rotation of the capstan. However, in speed modes other than X1/32, the signal at point (A) becomes high and the Q11 output becomes low. The signal at point (B) becomes low as does the output of IC30. This prevents influence on the capstan motor in speed modes other than X1/32. IC32 decides the off timing of the capstan motor when switching from any mode to the still mode. When the FG signal drops below 250Hz, IC32 is reset and the capstan motor turns off.

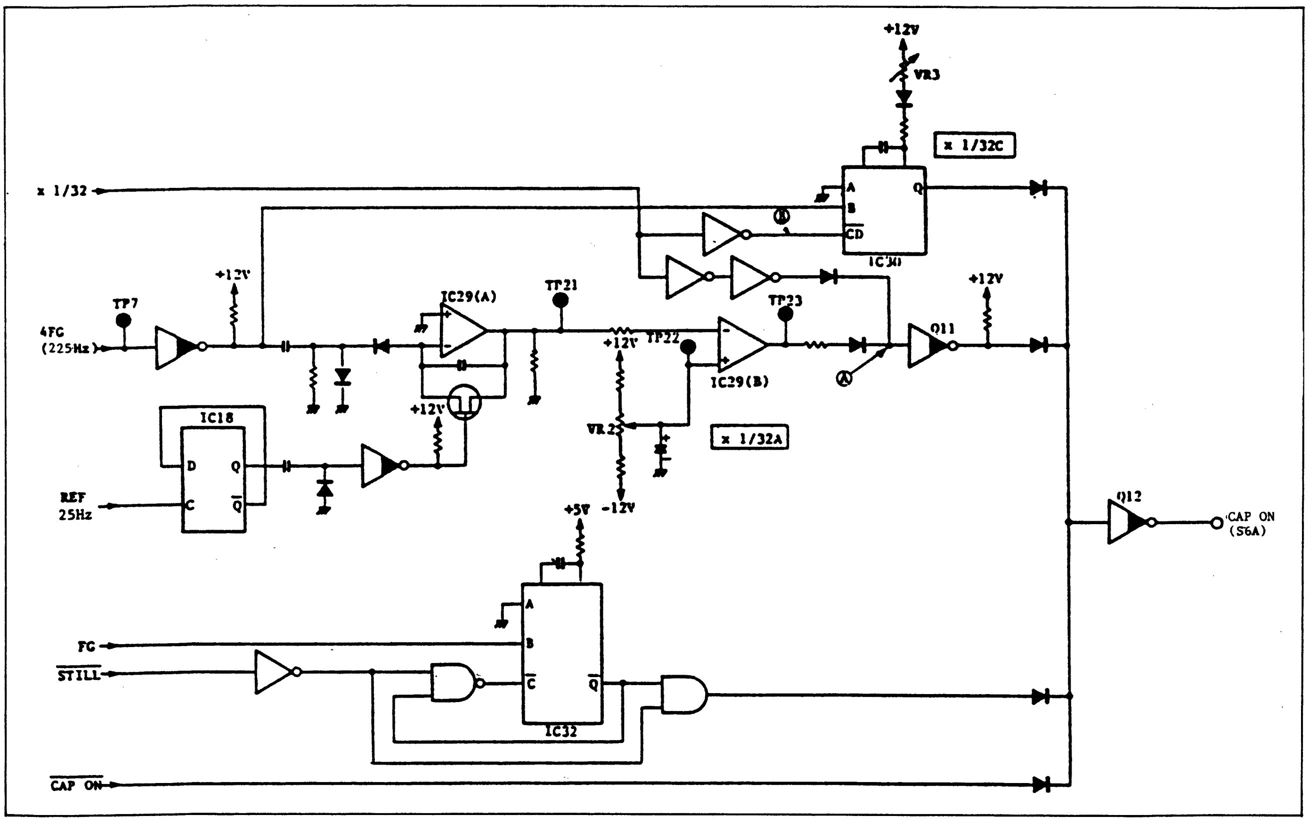


Fig. 5–28 1/32 Slow Control

	VARIABLE SLOW SPEED						
CLOCK MODE	64/32	32/32	16/32	8/32	4/32	2/32	1/32
	60/32	30/32	15/32	↓			
	56/32	28/32	14/32	7/32			
	52/32	26/32	13/32	↓	↓		
	48/32	24/32	12/32	6/32	3/32		
	44/32	22/32	11/32	↓			
	40/32	20/32	10/32	5/32			
	36/32	18/32	9/32	↓	↓	↓	
SERVO MODE	x2	x1	x1/2	x1/4	x1/8	x1/16	1/32

Fig. 5–29 Variable Slow

5–19. VARIABLE SLOW CONTROL

The variable slow control circuit performs fine control of the speed between speed modes to achieve smooth speed changes.

The speed divisions between modes are as follows.

8 steps between X2 and X1, X1 and X1/2, and X1/2 and X1/4
4 steps between X1/4 and X1/8
2 steps between X1/8 and X1/16

The speed is changed by changing the internal reference signal (normally 2.98MHz) of the digital servo IC in steps.

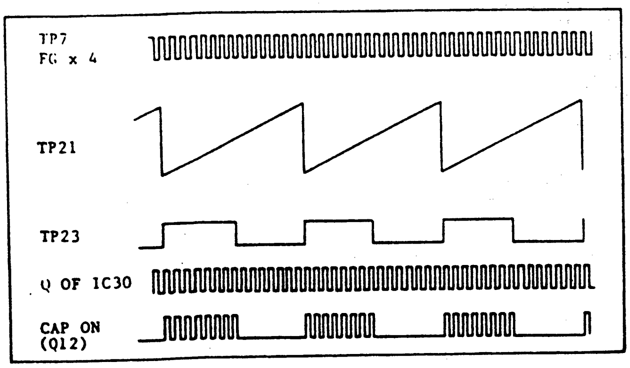


Fig. 5–30 X 1/32 Slow Speed Control Signal

5–20. MODE DETECTOR

The mode detector circuit controls the capstan error voltage amplifier gain while monitoring the tape speed FG signal in order to ensure quick and gentle speed changes.
This circuit makes quick and gentle speed changes possible by continually monitoring the FG period via a retriggerable MMV and turning the control gain switch on and off in response to the speed mode. Figure 5–32 shows the schematic diagram of this circuit. The two MMV of IC33 are retriggerable MMV that monitor the FG period. (B) of IC33 is T=0.7 ms, and (C) is T=0.15ms. In the X1/32 to X1/2 modes the FG X2 signal is input to B. The FG frequency at this time raises the error voltage amplifier gain when above approximately 700Hz and decreases it when below 700Hz.

Figure 5–34 shows the timing chart for monitoring the FG signal. When the FG period drops below that set in the MMV, the output becomes continuously high and the gain is decreased. In (C) of IC33, the FG signal is input to (B) in the X1 and X2 modes. When the FG is above approximately 6700Hz, the gain is increased. When it is below 6700Hz, the gain is decreased. The difference between circuits (B) and (C) is that in (B) a pulse signal is used, where as in (C) the gain is changed at a point below a certain period. This is done to control the speed based on the frequency of the FG signal. Figure 5–33 shows the error voltage amplifier. The PWM signal for speed control and the PWM signal for phase control are mixed in the filter and control the gain of each amplifier circuit depending on the mode. IC44 is used to improve the rise at start.
By adding synchronize control using an analog voltage after the PWM output of this circuit, the speed is controlled.

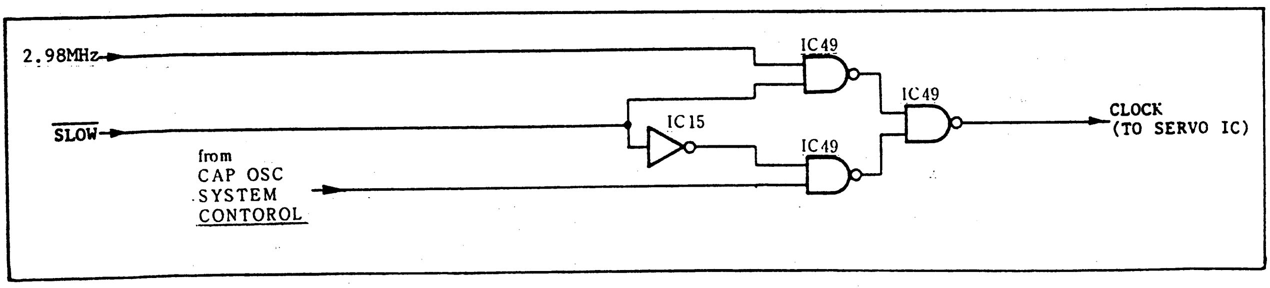


Fig. 5–31 Clock Control

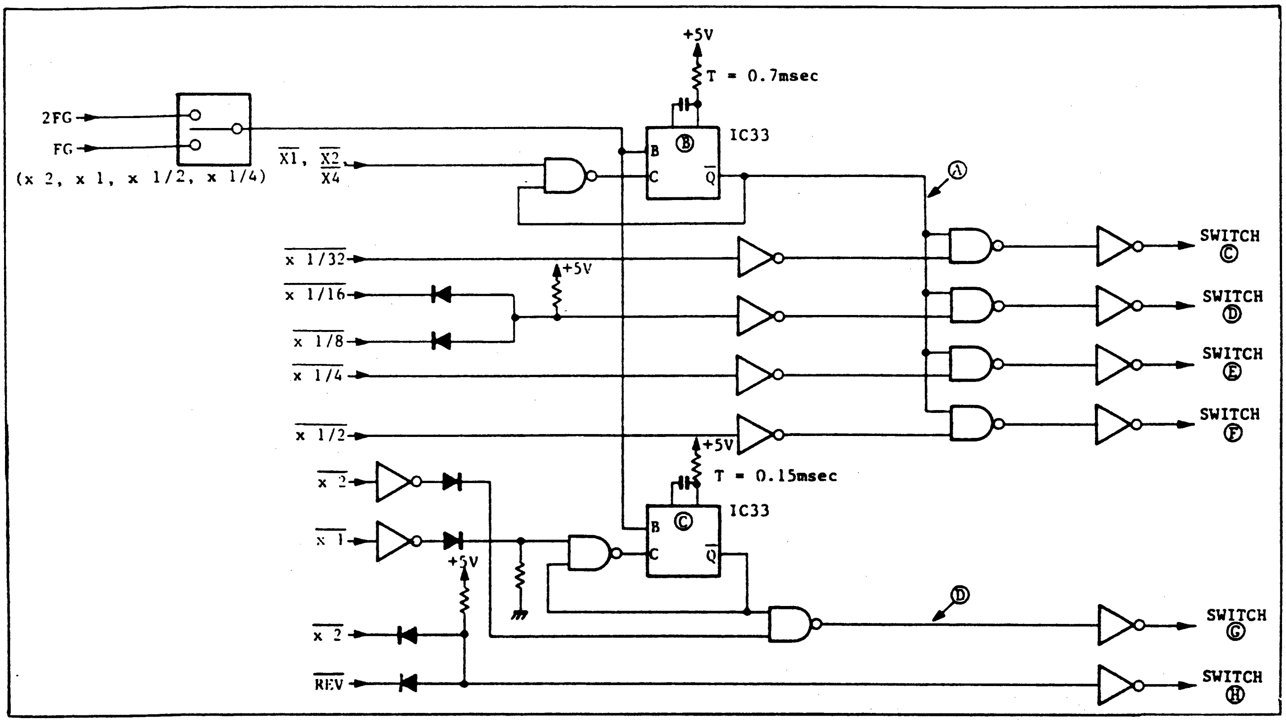
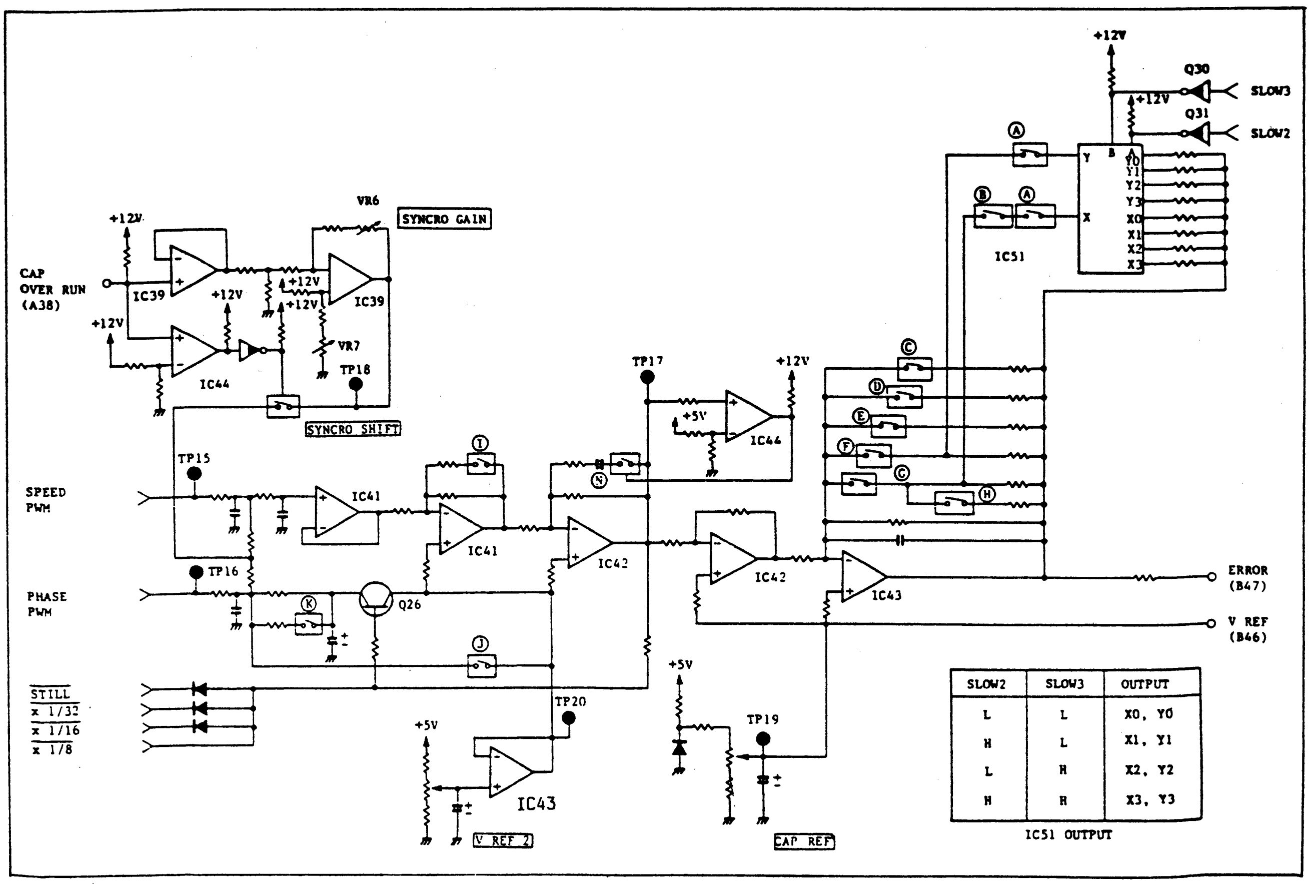


Fig. 5–32 Mode Detector



SLOW2	SLOW3	OUTPUT
L	L	X0, Y0
H	L	X1, Y1
L	H	X2, Y2
H	H	X3, Y3

IC51 OUTPUT

Fig. 5–33 Error Voltage Amplifier

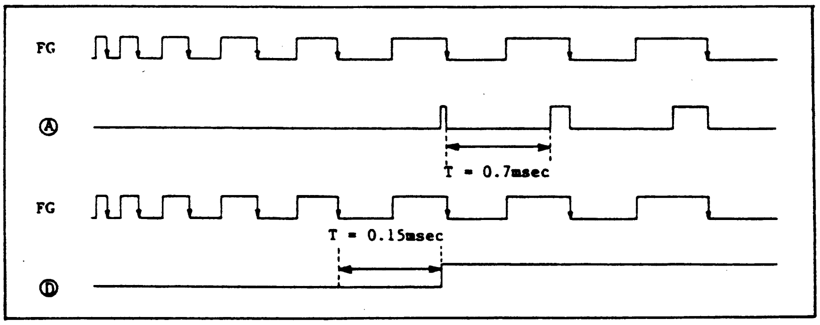


Fig. 5-34 FG Frequency Detector

MODE	SWITCH	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓘ	Ⓙ	Ⓚ
NORMAL SLOW MODE	x 4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
	x 2	OFF	OFF	OFF	OFF	OFF	OFF	ON *2	ON	OFF	OFF	ON
	x 1	OFF	ON	OFF	OFF	OFF	OFF	ON *2	OFF	ON	OFF	OFF
	x 1/2	OFF	OFF	OFF	OFF	OFF	ON *1	OFF	OFF	ON	OFF	ON
	x 1/4	OFF	OFF	OFF	OFF	ON *1	OFF	OFF	OFF	ON	OFF	ON
	x 1/8	OFF	OFF	OFF	ON *1	OFF	OFF	OFF	OFF	ON	OFF	ON
	x 1/16	OFF	OFF	OFF	ON *1	OFF	OFF	OFF	OFF	ON	OFF	ON
	x 1/32	OFF	OFF	ON *1	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
	STILL	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
VARIABLE SLOW MODE	x 2	ON	OFF	OFF	OFF	OFF	OFF	ON *2	ON	OFF	ON	ON
	x 1	ON	ON	OFF	OFF	OFF	OFF	ON *2	OFF	ON	ON	OFF
	x 1/2	ON	OFF	OFF	OFF	OFF	ON *1	OFF	OFF	ON	ON	ON
	x 1/4	ON	OFF	OFF	OFF	ON *1	OFF	OFF	OFF	ON	ON	ON
	x 1/8	ON	OFF	OFF	ON *1	OFF	OFF	OFF	OFF	ON	ON	ON
	x 1/16	ON	OFF	OFF	ON *1	OFF	OFF	OFF	OFF	ON	ON	ON
	x 1/32	ON	OFF	ON *1	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

FG
*1: T = 0.7msec
*2: T = 0.15msec

Fig. 5-35 Error Amplifier Control

DRUM SERVO

5–21. GENERAL DESCRIPTION

This circuit has two principal functions.

1. Control of the drum.
2. Generation of head switching pulses and recording control signals

This circuit is located on the same circuit board as the capstan and reel servo circuit.

DRUM SERVO CONTROL

This circuit synchronizes the drum with incoming signals. This control is divided into,

1) phase control
2) speed control

Both the phase control and speed control circuits use digital processing. A simplified block diagram is shown below.

As can be seen in the diagram, for speed control, a trapezoidal wave is produced from the internally generated 14.318MHz clock, and a preset pulse and sampling pulse are produced from the drum motors FG signal.

For phase control, a trapezoidal wave is also produced from the internally generated 14.318MHz clock as in speed control, and the H.SW pulse produced from P/G is used as the sampling pulse. The error voltage, produced by a sample/hold, is mixed with the speed control error voltage and both are used to control the drum. All subsequent operations (trapezoidal wave, S/H, D/A) use digital processing. In editing, it is necessary to match the phase of the input signals V sync at the cut–in point with the V sync of the playback signal. If the phases of the vertical signals do not match, skew error will result making it impossible to detect framing. Therefore, the phase difference between REF V sync and PB sync is detected and used to change the trapezoidal waves phase in the phase control circuit.

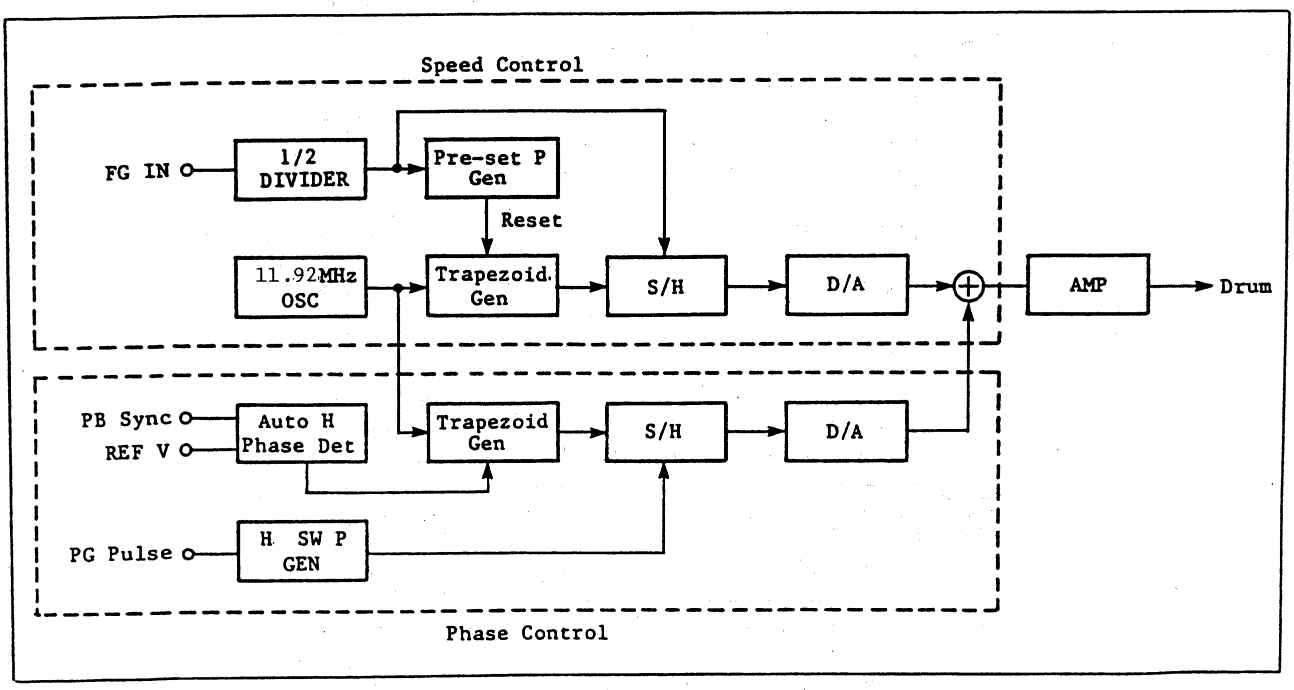


Fig. 5–36 Drum Servo Simplified Block Diagram

Drum Motor

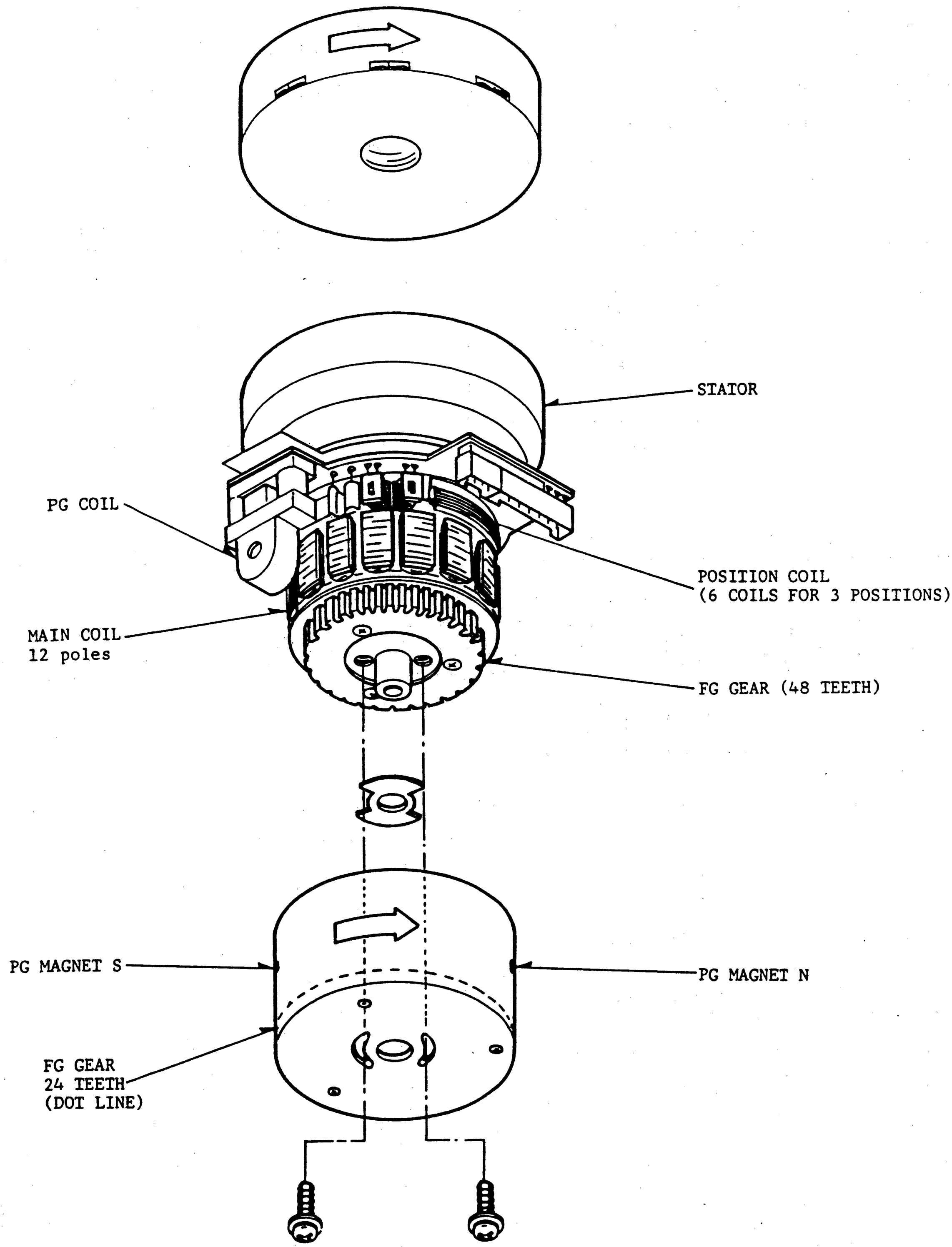


Fig. 5–36 (b) Drum Motor Construction

5–22. SPEED CONTROL

Refer to the block diagram in figure 4–40. The FG signal (1200Hz at X1 speed) from the drum motor passes through the amplifier and is sent to the 1/2 divider where a sampling pulse (latch signal) and preset pulse are made.

This preset pulse is used to reset, and the sampling pulse is used to sample/hold, the trapezoidal wave made by the counter.

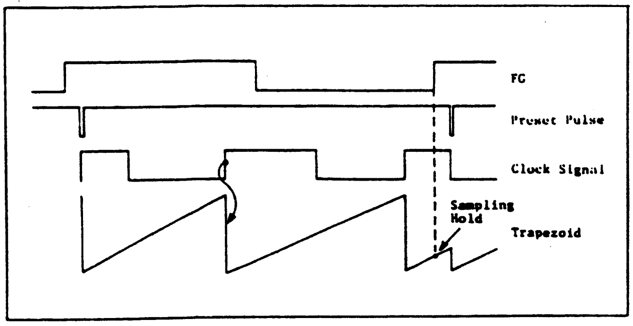


Fig. 5–37 Speed Control Sample/Hold

5–23. FG AMPLIFIER, DIVIDER, OSCILLATOR

The FG signal generated by the drum motor is amplified by Q34 and IC53 and is sent to the 1/2 divider IC77. The FG frequency is 1200Hz in normal playback. The 1/2–divided FG signal is slightly delayed in C104 and then latched in IC55. This will be explained later, but note that this is necessary to synchronize the FG with the clock signal.

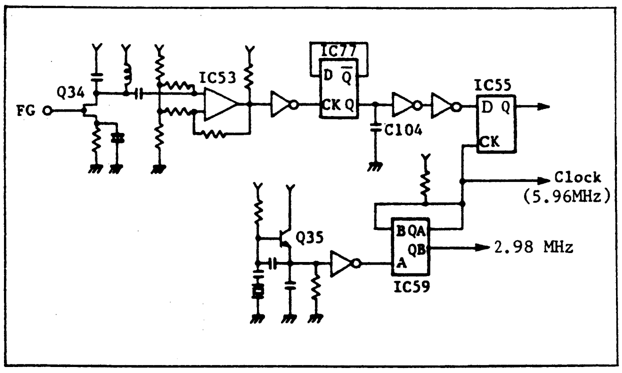


Fig. 5–38 FG Amp/Divider/OSC

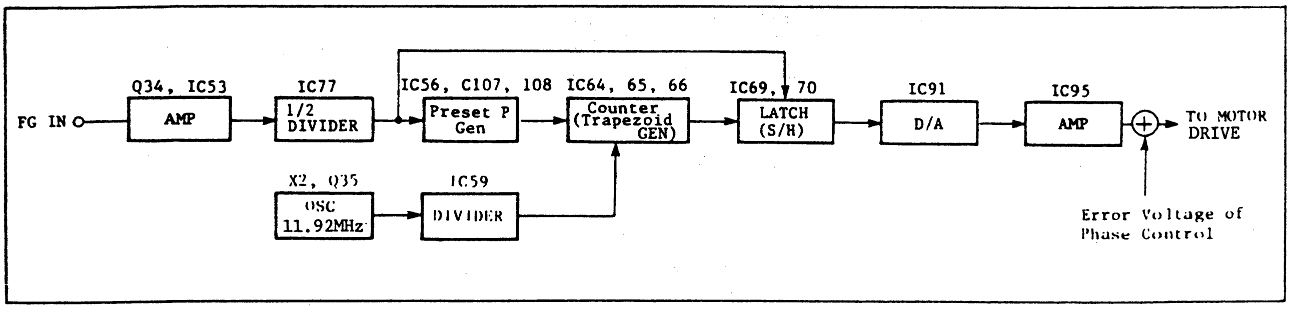


Fig. 5–39 Speed Control Block Diagram

5–24. PRESET GENERATOR, TRAPEZOID, S/H

Refer to the schematic in figure 5–41 the 600Hz 1/2– divided FG signal separates into two signals. One goes to the preset generator composed of IC56 and IC57, and the other one goes to the latching (sampling/hold) circuit composed of IC69 and IC70. IC64, IC65, and IC66 form a 12 bit counter where the trapezoidal wave is produced, and IC61 and IC67 form the overflow detection circuit. Now we will explain each of the circuits. The FG signal is delayed in C107 and R168, and the width of the preset signal is determined in R169 and C108. The delayed signal is latched by the clock signal (5.96MHz) in IC57 and then sent to the LOAD terminal of the counter composed of IC64, IC65, and IC66. When the LOAD signal is low, the counters are reset. The clock signal with a frequency of 5.96MHz, is passed through the AND gate in IC67 and gated with the output of the overflow detection circuit, it is now applied to the clock terminal of the counters. The overflow detection circuit uses the QD output of IC66 as the clock signal for IC61, the carry out (CO) signal of IC61 is combined with the respective maximum signals of the counters in AND gate (IC63). Therefore, when an overflow is detected, the clock signal is prevented from reaching the counters. When a carry out of IC61 does not occur, a high is output and inverted to low by IC64. This low is latched by IC57 to clear (reset) IC69 and IC70.

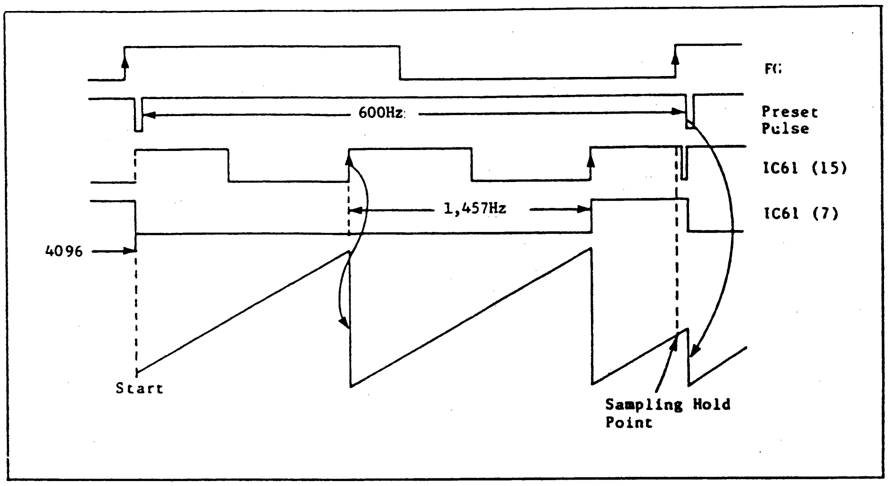


Fig. 5–40 Speed Control Timing Chart

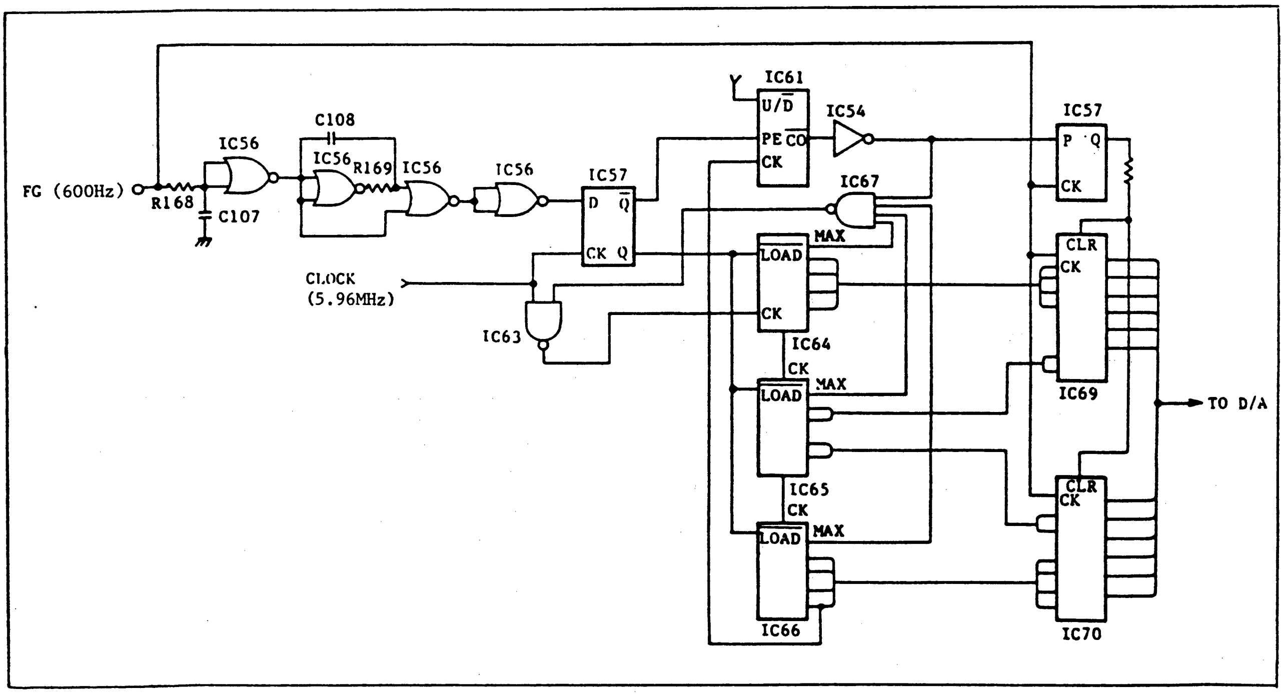


Fig. 5–41 Preset P Gen/Trapezoid/ S/H

5–25. D/A and Drive

Refer to the schematic diagram in figure 4–43. The sample/hold information from IC69 & 70 is sent to the D/A converter IC91 where the speed error voltage is generated. After the error voltage is amplified in IC93, it is mixed with the error voltage of the phase control circuit. VR13 is used to adjust the gain, and VR15 is used to set the drive circuit reference voltage. If the drum speed decreases for any reason (tape sticking, servo failure, etc), the motor should be stopped completely. IC99, IC100, and Q37 combine to form a circuit for this purpose. The error voltage output is clamped to zero by Q37. This circuit will immediately cut the control voltage to the motor, when the motor develops an abnormal condition.

The PG signal from the drum motor is detected to determine whether or not the drum motor is turning.
If the drum motor is turning, the PG signal triggers IC99, causing the output (pin 9) to become low. This low is used to set IC100. The PG signal is also sent to a second MM inside of IC99. This MM output is sent to the data input of IC100 and is latched by the inverted PG signal, when the head is turning close to the correct speed, the time constants of the MMV's will keep the (Q) output of IC100 low, causing Q37 to be turned off. If the motors speed decreases, IC100's Q output will be latched high, turning on Q37 and cutting off the error voltage.

This circuit detects whether either the drum servo or the capstan servo are operating properly. Operation of the drum servo is detected by comparing the REF V signal with the head switching signal made from the PG signal. If the servo is locked, REF V is latched by the head switching signal, and the detector's output goes low, but if the servo is not operating, the output will be high.

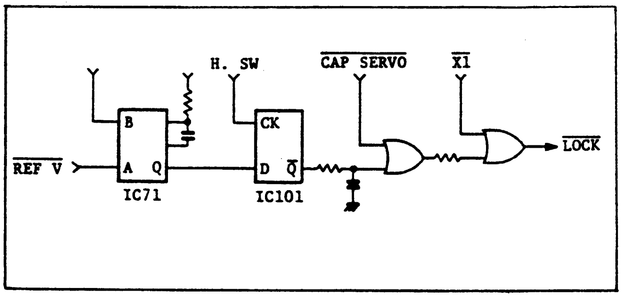


Fig. 5–43 Servo Lock

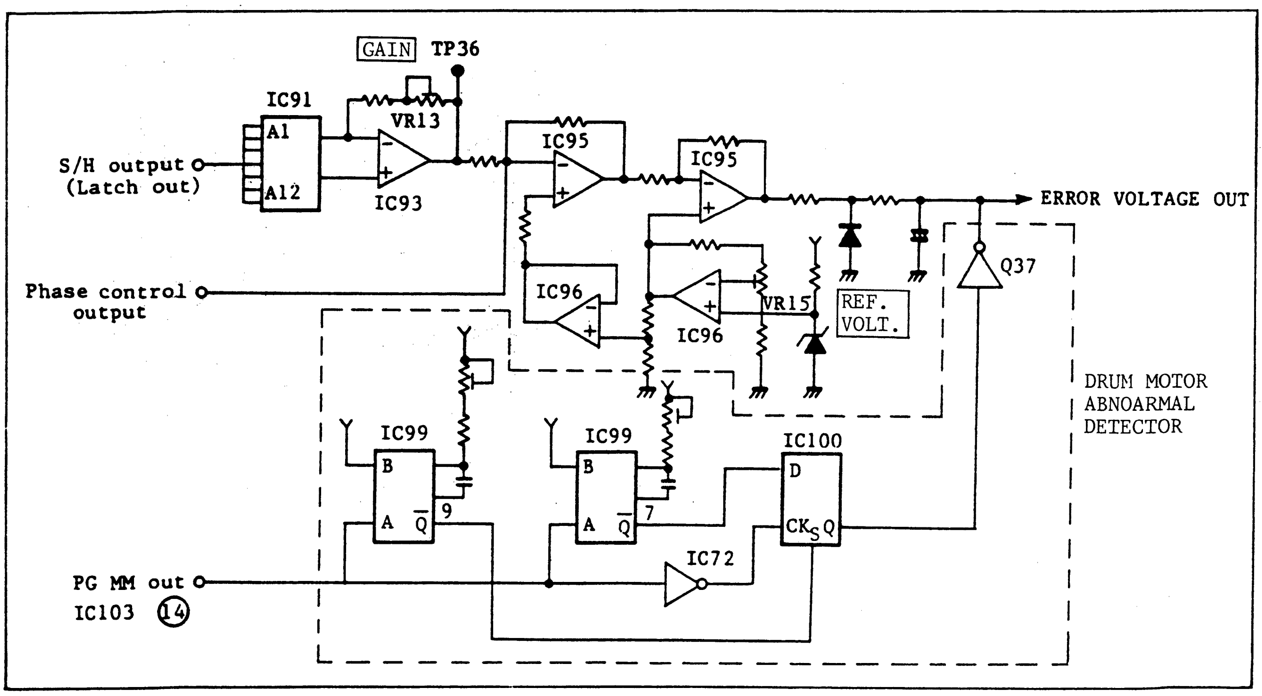


Fig. 5–42 D/A and Drive

5–27. PHASE CONTROL CIRCUIT

Phase control is performed by comparing the phases of REF V with the head switching pulse produced from the PG signal. The reference signal head switching pulse is used as the sampling pulse.

This circuit also includes an auto H phase circuit which automatically detects the H phase of the playback signal and the record signal when editing and prevents a divided H (skew error) at cut-in.

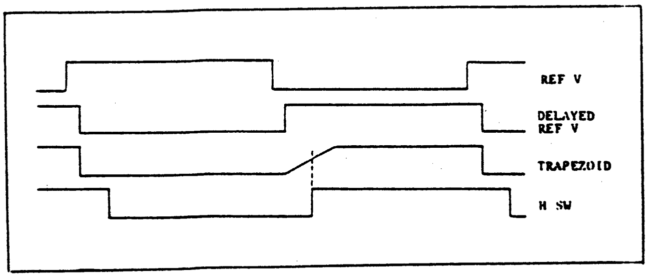


Fig. 5–44 Phase Control

As with speed control, all of the above operations are performed by digital processing. Refer to the schematic diagram in figure 5–45. IC86, IC87, IC88, IC89, and IC90 perform phase control, and IC81, IC82, and IC83 compose the auto H phase circuit.

We will first talk about the phase control circuit. A trapezoidal wave is made in IC86, IC87, and IC88.
Using a 5.96MHz clock. The slope of the trapezoidal wave is determined by the floating detection circuit IC84. The maximum output count of IC86, 87 & 88 is 4096, so the maximum time is approximately 570 microseconds. The trapezoidal wave is then sent to the sample/hold in IC89 and 90 by the head switching pulse. This signal (from the sample/hold) passes through the D/A converter IC92 and is mixed with the speed control signal.

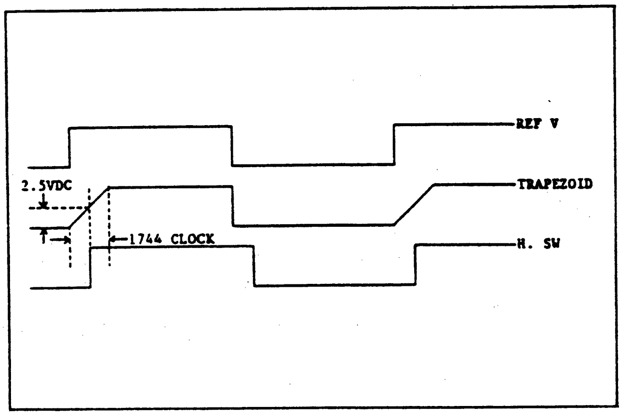


Fig. 5–46 Phase Control Timing Chart

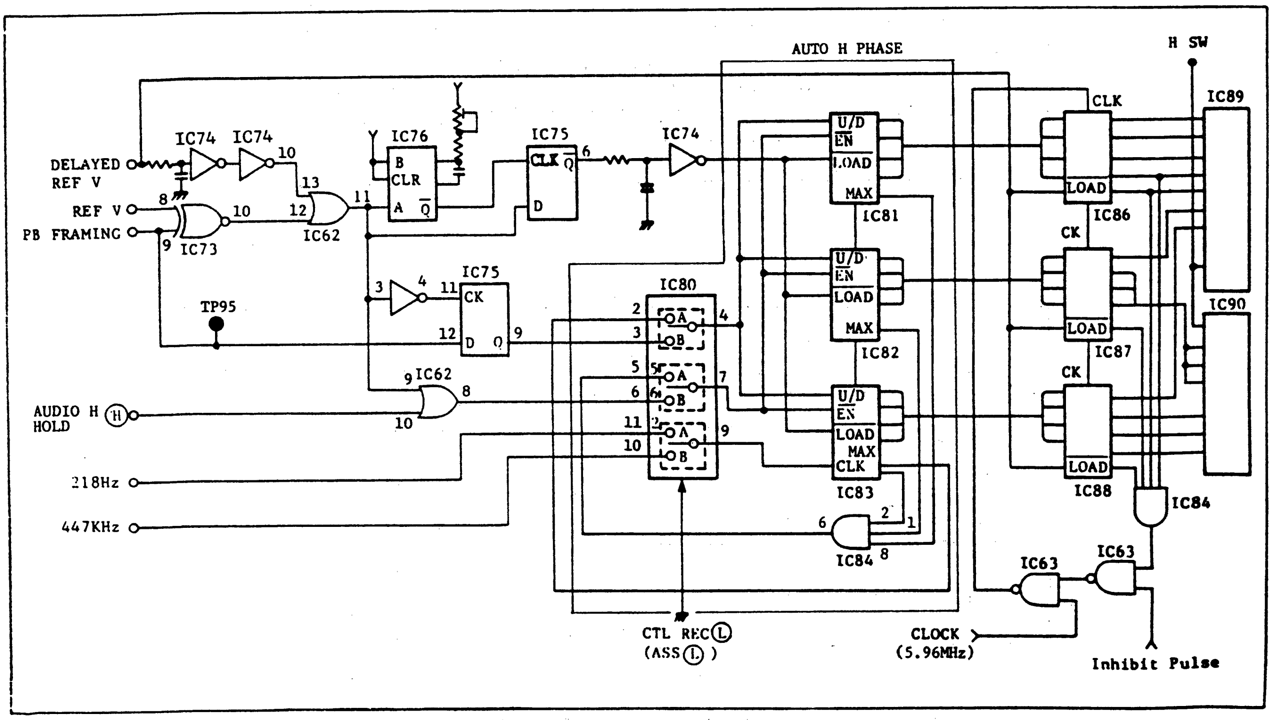


Fig. 5–45 Phase Control Schematic Diagram

Next, we will talk about the auto H phase circuit. To determine the phase difference between playback and the signal to be recorded, it is necessary to detect the phase of the recorded V sync and the phase of the V sync signal to be recorded. IC70, IC73, and IC62 form the circuit that detects this phase difference and IC75 (pin 9) is used to determine. The direction of count according to which pulse is ahead or behind. If the phase is behind in editing, it up counts the preset value the amount it is behind, and if it is ahead, it down counts the preset value. The preset value is determined by IC81, IC82, and IC83 using a 447–kHz clock signal.

The EDIT mode has an INSERT mode and an ASSEMBLY mode, both of which use nearly the same control method except for one difference. If the preset amount is changed in the INSERT mode, that condition is maintained from cut–in to cut–out, whereas in the ASSEMBLY mode, the preset value gradually returns to its original value. This is because in the ASSEMBLY mode the cut–out phase is of no consequence,and so the trapezoidal wave is given a broad slope to ensure stability. However, in the insert mode, the phase at the time of cut–out is important, and so the condition established at the time of cut–in is maintained until cut–out.

Switching from the INSERT mode and the ASSEMBLY mode is performed by IC80. In the ASSEMBLY mode the IC is switched to A, and in the INSERT mode it is switched to B, Each of the modes will now be explained. We will start with the INSERT mode. In the INSERT mode, IC80 is switched to B, and so the 447–kHz clock signal is sent to the counter composed of IC83, IC82, and IC81. The preset value at this time is set by detection of the phase difference using IC62 which sends it to the ENABLE (EN) input of the counters however, the instant recording begins, the MOD (high) signal is sent to IC62, where the preset value is kept by making ENABLE high.

Detection of the direction of the difference is performed by sending the output of pin 9 of IC75 to the U/D input of the counters. When IC75 (pin 9) is low, the preset value is up counted, when it is high, the preset value is down counted. A problem that is encountered here is that over correction of the preset value will cause the X value to change.
Therefore the amount of correction is limited by IC76 and IC75. This amount is approximately 200 us. If the phase difference is more than 200 us, the LOAD input is mode low and the counters are disabled.

In the ASSEMBLY mode, the preset value is gradually returned to its original value in IC84 by using a 218–Hz clock signal.

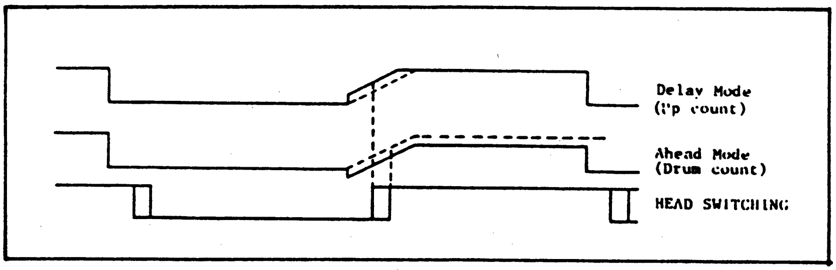


Fig. 5–47 Auto H Phase ✱N

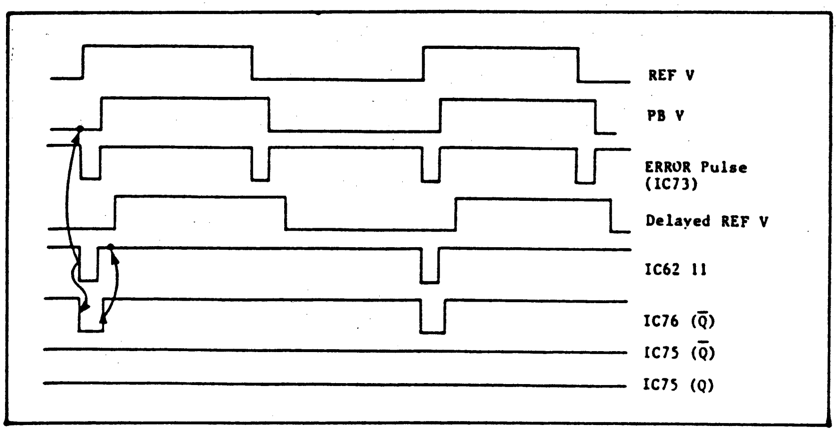


Fig. 5–48 Auto H Phase Timing Chart ✱N

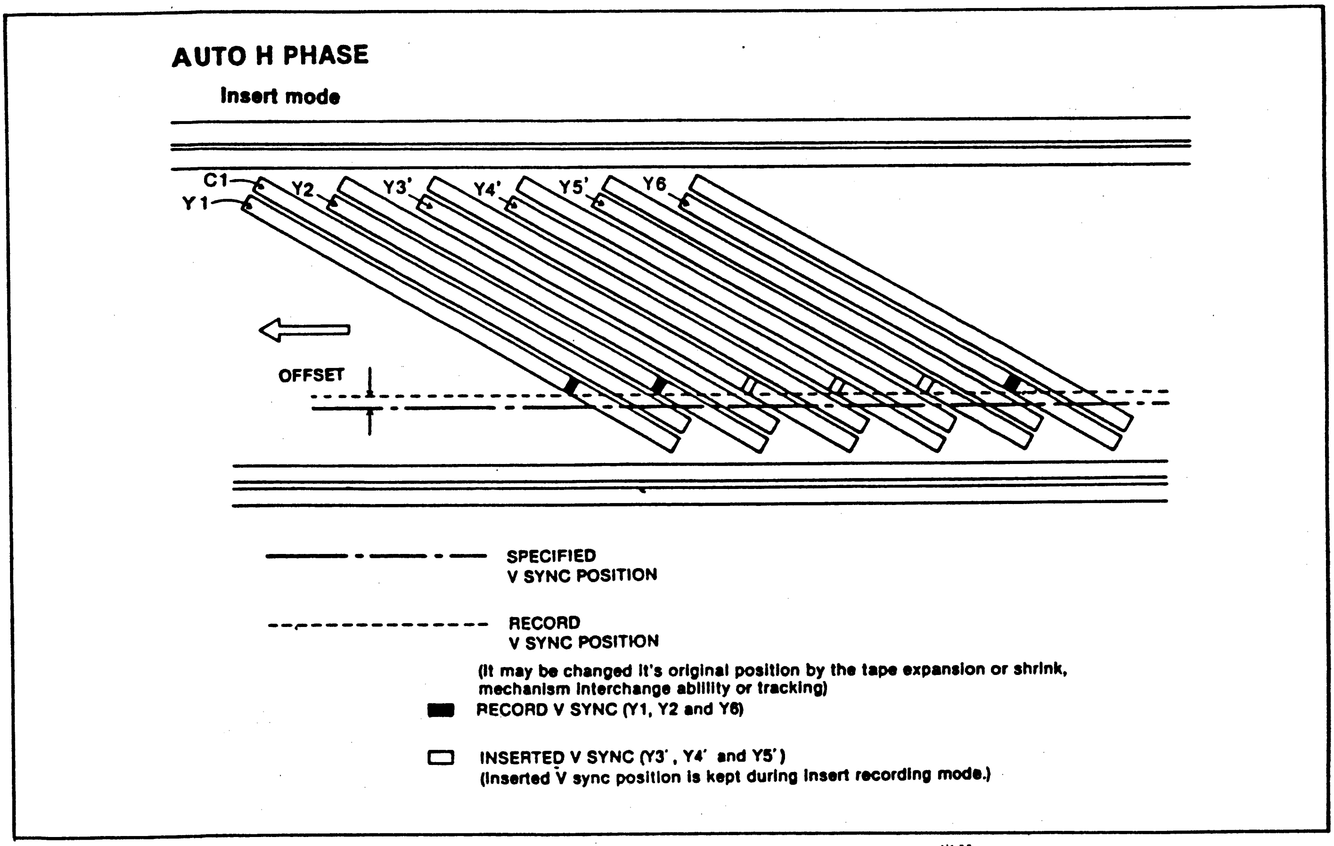


Fig. 5–48 (b) Assembly Mode Auto H Phase *N

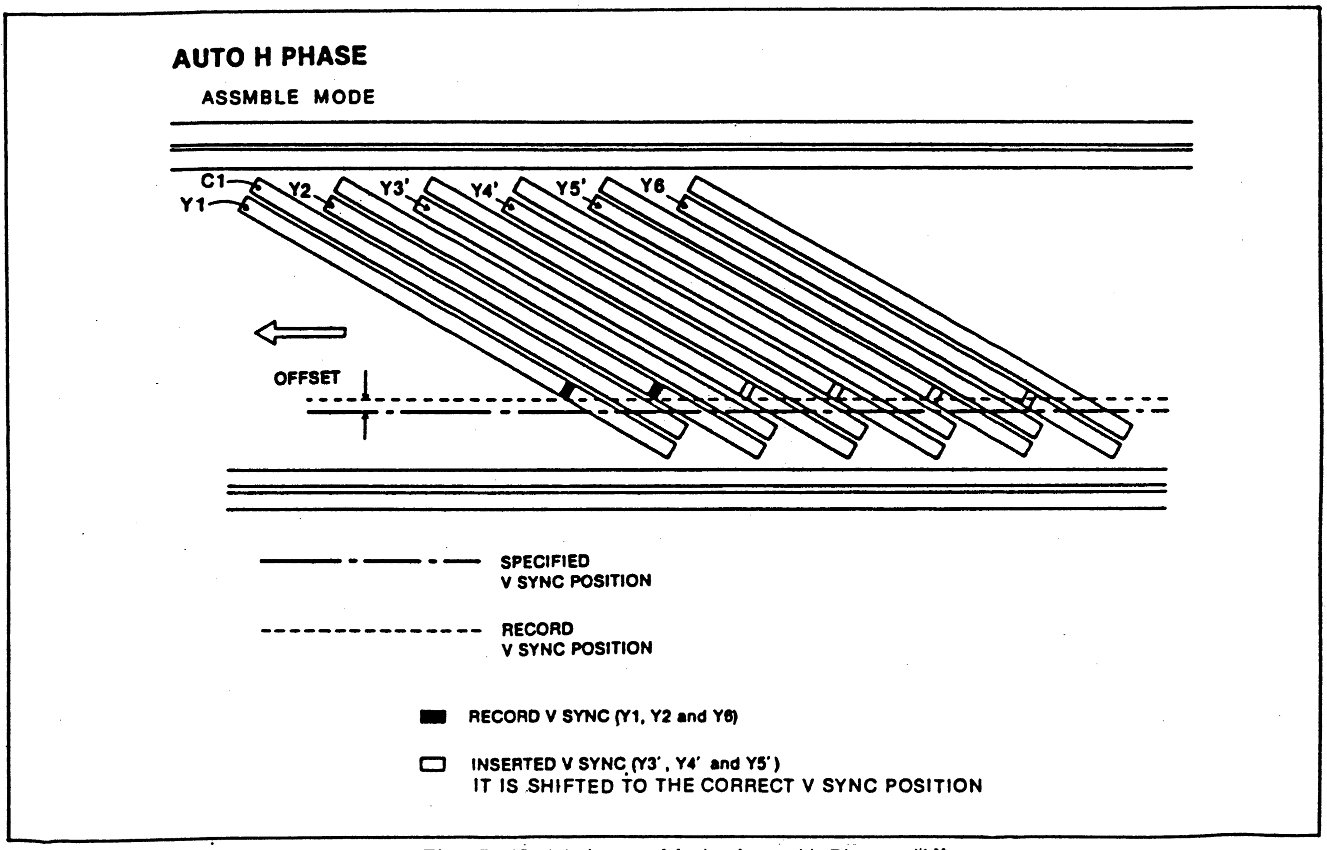


Fig. 5–48 (c) Insert Mode Auto H Phase *N

5–28. DELAY V REF (REC SHIFTER) AND INHIBIT PULSE GENERATOR

This circuit works with the rec shifter circuit to prevent floating when down counting during auto H phase operation. The rec shifter is located 2.75H after the following edge of V sync and is produced from the 25Hz signal sent from the sync generator. This is made from the second serration of the V sync, and is therefore adjusted in IC78 so it occurs 2.75H later.

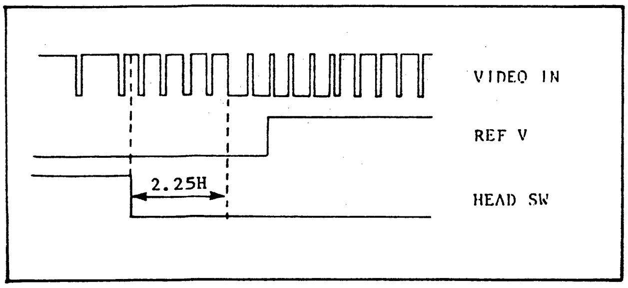


Fig. 5–49 Rec Shifter

If down counting should occur during auto H phase operation, overflow will occur at the zero cross point, making sample/hold impossible. To prevent this, overflow is disabled for 200 us after the preset time.

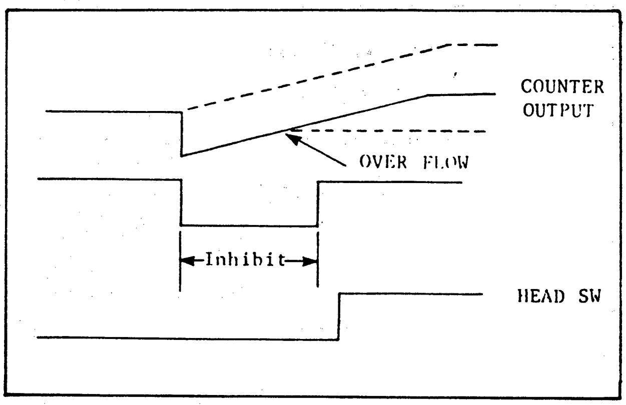


Fig. 5–50 Over Flow Inhibit

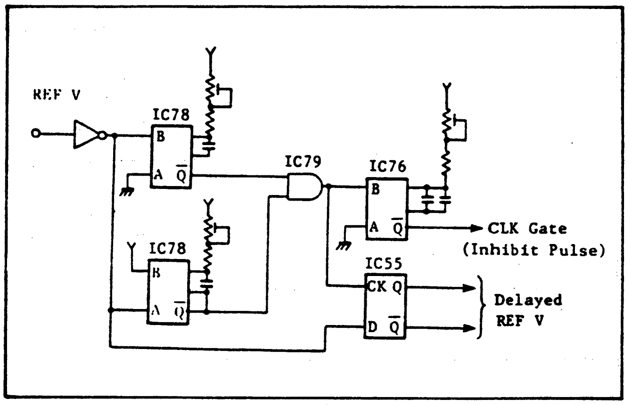


Fig. 5–51 Rec Shifter Circuit ✱N

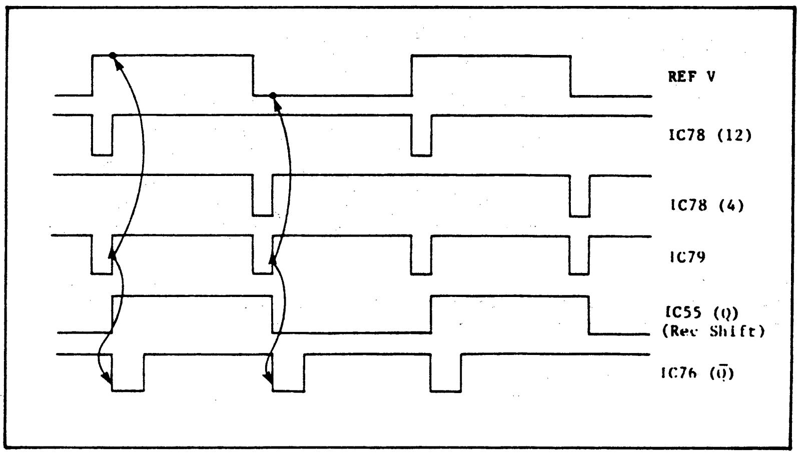


Fig. 5–52 Rec Shifter Timing Chart ✱N

5–29. DRUM SERVO LOCK DETECTION

The three purposes of this circuit are:

1. To detect whether the drum motor is turning.
2. To detect whether the drum servo is operating properly.
3. To detect whether the drum capstan motor is locked.

To detect whether or not the drum motor is turning, the PG pulse signal produced by the motor is used.
The PG pulse (MM output) goes to IC99. The first MM (pin 9 of IC99) is a PG pulse detection circuit.

If the speed goes above a certain level, the pin 9 output becomes low causing the pin 1 output of IC100 to become low. This information is then sent to the system control circuit.

To detect whether or not the drum servo is operating properly, the REF V signal and the head switching pulse made from the PG pulse are compared. When drum servo operation is correct, pin 13 of IC100 becomes high. To detect whether the drum or capstan motor have become locked, the REF V and H switching signals are compared. When operating normally, the output of pin 12 of IC101 is high, and when an abnormality occurs, it becomes low.

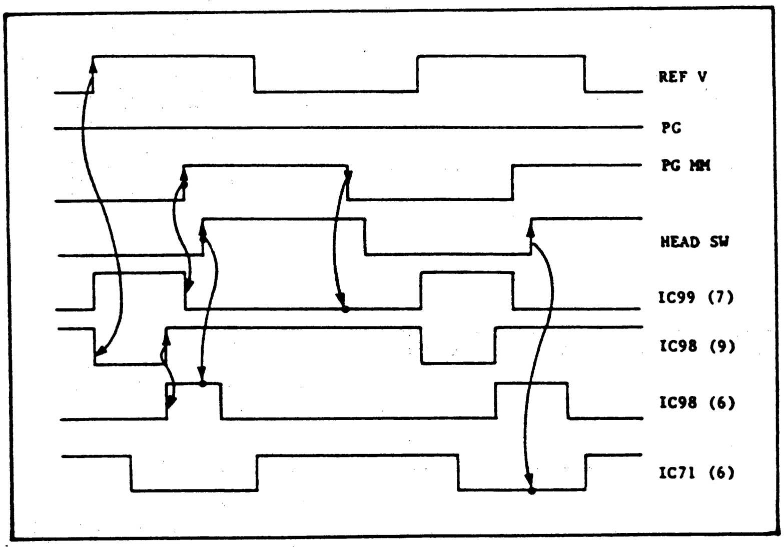


Fig. 5–53 Drum Servo Lock Detection

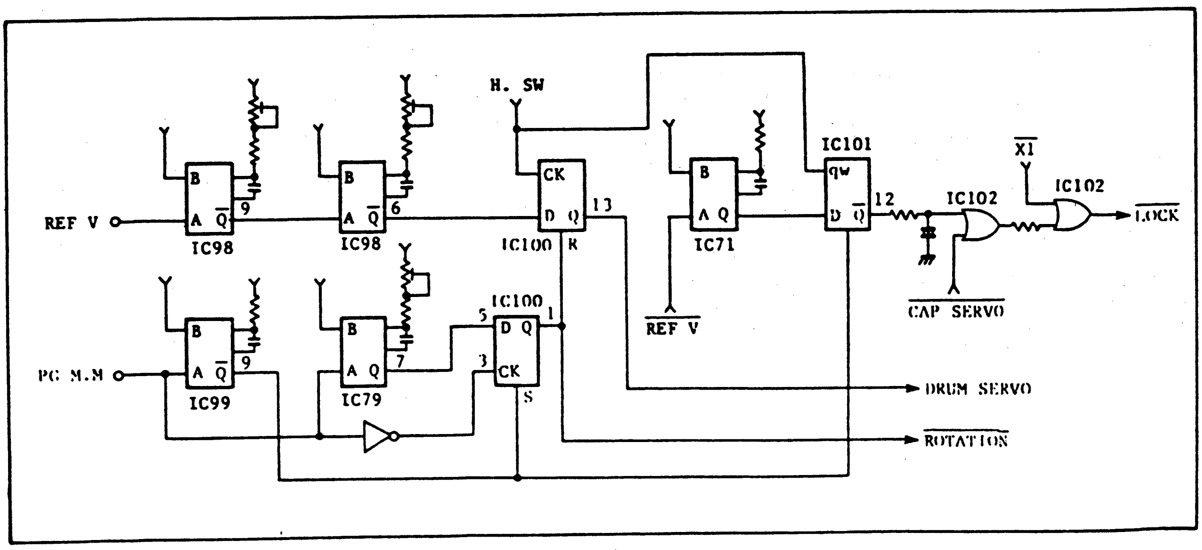


Fig. 5–54 Drum Lock Detection

5-30 COLOUR FRAMING CIRCUIT

EDITING OF COLOUR FRAMING

Shown in Fig. 5–55 are the relation of the REC VIDEO fields and the 6.25–Hz colour frame pulse,as well as the relation of the PB VIDEO fields and the 6.25–Hz colour frame pulse.
To enable perfect editing with the colour framing under complete control, the leading edge of the 6.25–Hz pulse is set to the very beginning of the V1 field and one period of the pulse extends over the eight fields V1 through V8.
The REC colour framing and the PB colour framing are matched with each other by bringing points (A) and (B), shown in Fig. 5–55, in phase. To do this, the playback tape speed is increased or decreased under the capstan servo control.

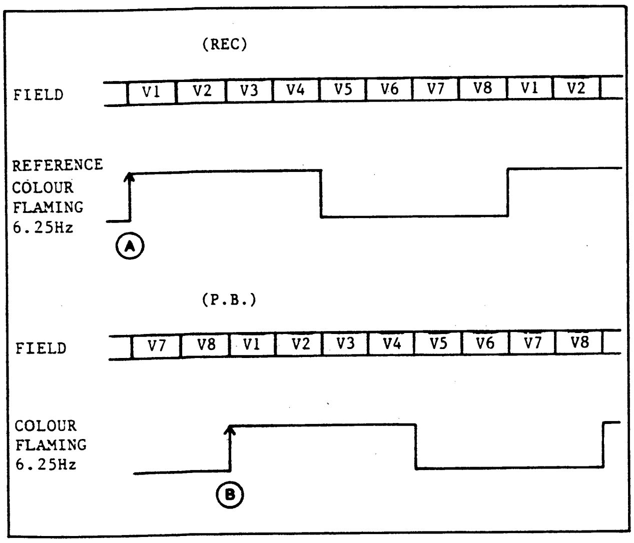


Fig. 5–55. Colour Framing 6.25Hz

COLOUR FRAMING SERVO SYSTEM

In this system, the timing between two points (A) and (B), shown in Fig. 5–55, is judged total whether they are ahead of or behind each other. If point (B) is behind point (A), IC227 and IC228 is set to the Low position loosen the brake and speed up the capstan until these two points will meet each other. If point (B) is ahead of point (A), on the contrary, IC228 is set to the High position to tighten the brake and slow down the capstan till the meeting of these two points. While the points are in phase, the switch is in such a position that the phase error voltage is being supplied to the brake as shown in figure 5–56,5–57.

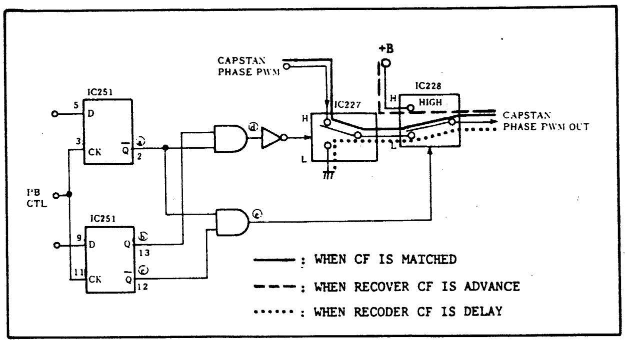


Fig. 5–56 CF Error circuit

a b c	d e	PHASE PWMOUT	CAPSTAN SPEED
0 0 1	0 0	PWM	NORMAL
0 1 0	0 0	PWM	NORMAL
1 0 1	0 1	H	DOWN
1 1 0	1 0	L	UP

Fig. 5–57 CF Error Logic Table

COLOUR FRAMING ERROR DETECTION

Fig. 5–58,5–59 shows how to detect the colour framing error.
For this purpose, the leading edge of the 6.25–Hz reference colour frame pulse (TP43) and that of the 6.25–Hz PB colour frame pulse (TP33) are compared as to their phase.
Firstly, the window pulse (IC251–5) is generated from the leading edge of the 6.25–Hz reference colour frame pulse (TP43) by an MMV (mono–multi vibrator).
The window pulse, used in place of the leading edge of the pulse (TP43), keeps the right phase. When the leading edge of the 6.25–Hz PB colour frame pulse (TP33) stays within the window pulse, the timing is judged to be good; if is judged to be improper.
If should be noted here that there are two types of errors; a lead error and a lag error. To see if an error is leading or lagging, the lead–lag detection pulse (IC251–9) is also generated from the leading edge of the reference colour frame pulse.

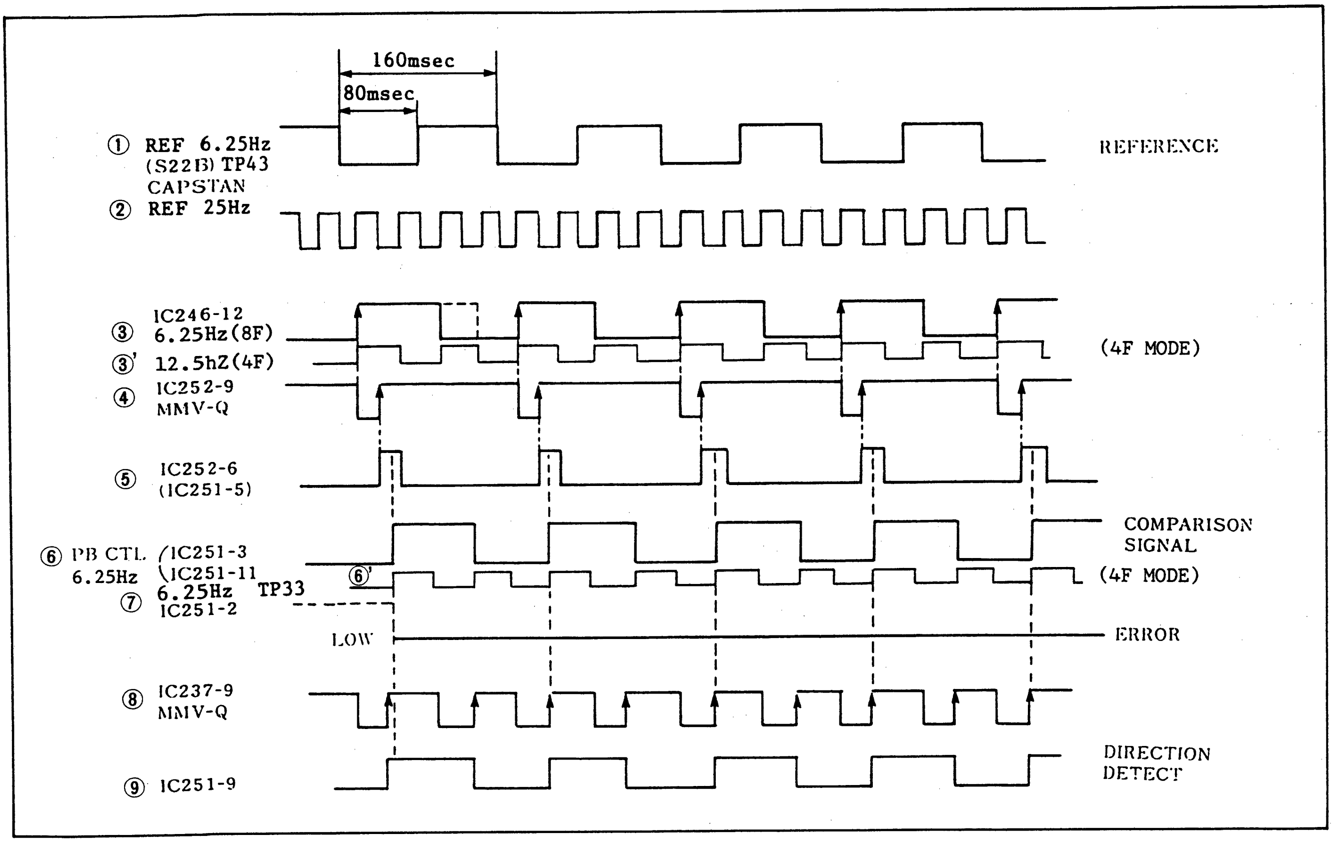


Fig. 5–58. CF Error Timing

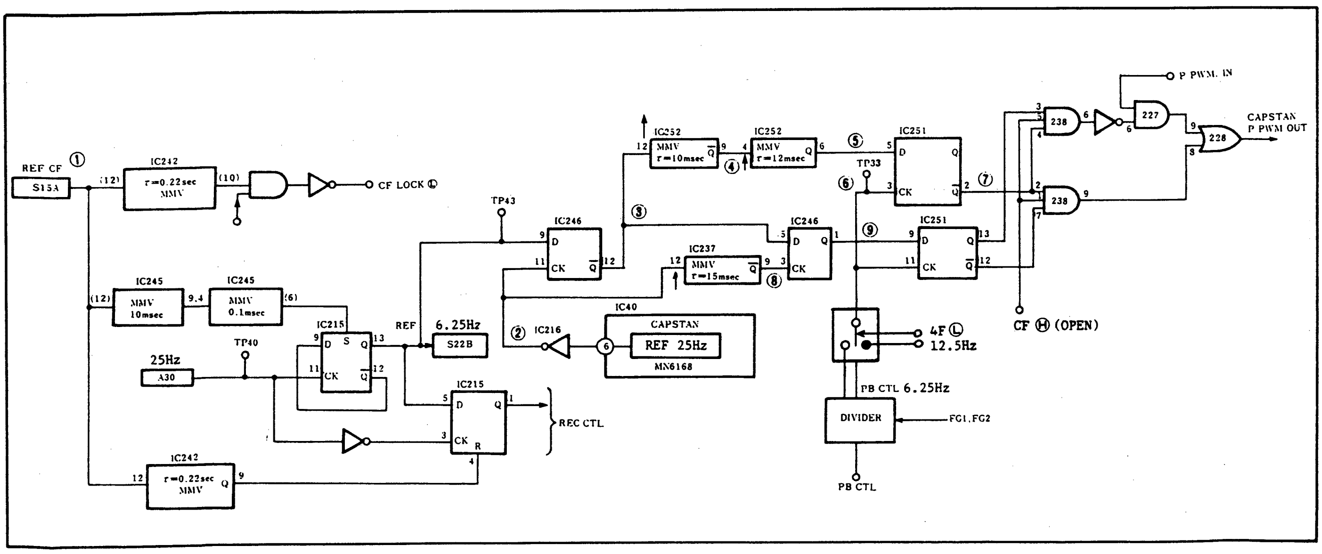


Fig. 5–59. Colour framing circuit

REC CONTROL PULSE

Fig. 5–60,5–61 shows how to generate the REC control pulse.
The 6.25–Hz colour frame pulse (2) has the fields V1 through V8, as shown in the arrangement (1), for each period.
The 6.25–Hz reference colour frame pulse is produced by detecting the burst phase. For playback ,however, use of the control pulse is more advantageous in circuit design and performance. Therefore the control pulse is added in the course of recording to give the information on the 6.25–Hz colour frame pulse. In practice, the control pulse width (duty) ratio is preset at 55:45% while the 6.25–Hz colour frame pulse (3) remains high, and 50:50% while it stays low. This recorded difference in pulse width duty ratio is detected during playback to provide for precise 6.25–Hz colour framing.
The above pulse width duty ratios are prepared in the following way. First the control pulse (4) with the pulse width duty ratio of 50:50% is generated. Next the 5% wide pulse (5) is made at the trailing edge of the pulse (4). The 5% wide pulse (5) is added to pulse (4) when the 6.25–Hz colour frame pulse (3) is high, and not added when the pulse (3) is low. This offers the control pulse (6) which two pulse width duty ratios; 55:45% and 50:50%.

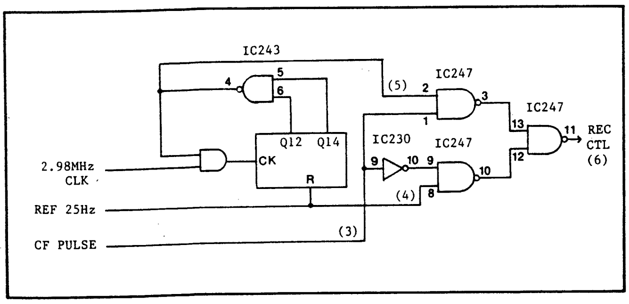


Fig. 5–60. Rec Control Pulse

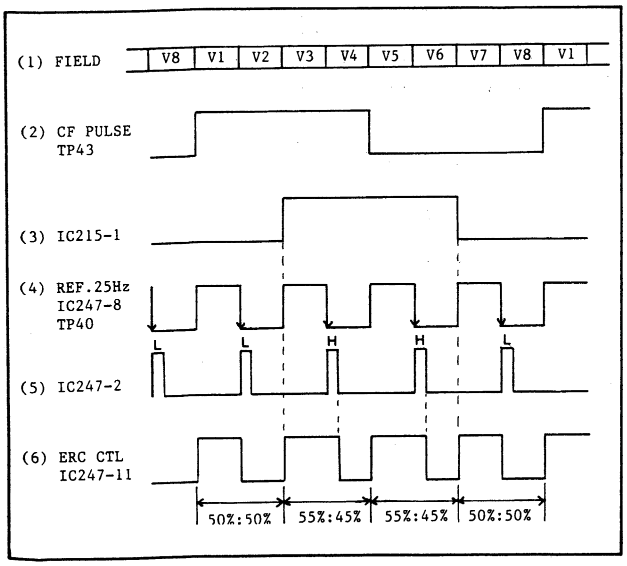


Fig. 5–61. Rec Control pulse timing

PB CONTROL PULSE

Shown in Fig. 5–62,5–63 is the principle of generating the 6.25–Hz colour frame pulse from the PB control pulse.
The PB control pulse (1) , being reproduced during playback, continuously gives a ratio of 55:45% and another ratio of 50:50% one after the other.
The detection pulse (2) is provided to detect the colour framing. This pulse becomes LOW at the leading edge of the PB control pulse, keeps the LOW level for a 47.5% pulse width, and then comes high. Note that the 47.5% pulse width reaches just the half of the total of 45% and 50% pulse widths.
The leading edge of the PB CTL pulse hits the low level of the Detection pulse in the range of a 50% duty, pushing the 6.25–Hz colour frame pulse high. During the 45% duty cycle, on the other hand, the LOW level of the detection pulse is detected, causing the 6.25–Hz colour frame pulse low. This way, the 6.25–Hz colour frame pulse is generated.

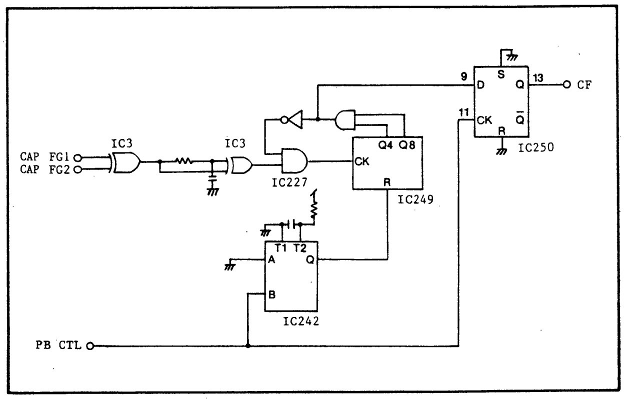


Fig. 5–62. PB Control Pulse

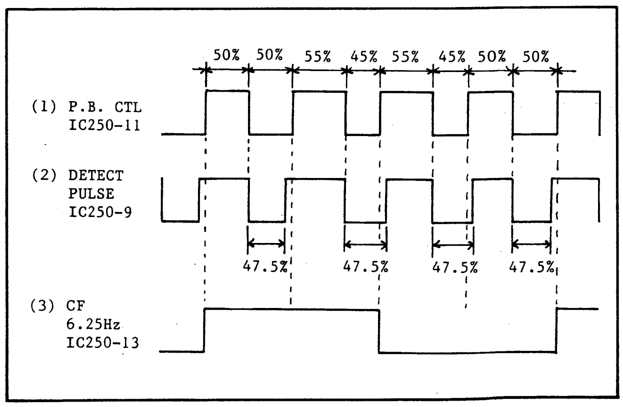


Fig. 5–63. PB Control pulse Timing

SERVO DRIVE

5–31 CAPSTAN MOTOR DRIVE

The capstan motor is a brushless direct drive motor, which is driven by the circuit shown in figure 5–60. Most of the drive functions are supplied by IC1 (AN640G). Except for the main coil drive transistor (Q1 to Q8). The essential functions inside IC1 consists of the following.

1. motor position detector
2. torque control
3. current comparator
4. voltage comparator
5. main coil pre–drives

TORQUE CONTROL

The torque control circuit compares the capstan error voltage at pin (4), and the reference voltage (3.6V) at pin (5), from the capstan servo control circuit on the servo board (L–5). The output of the torque control circuit controls the currents of the drive transistors. Capstan motor speed is inversely proportional to the error DC voltage at IC1 (pin 4).

CURRENT COMPARATOR

The current comparator circuit compares the current of the main coils with the voltage of the speed control output. The current of the main coils is input into IC1 pin 21. The comparator output is applied to the drive circuit to control the drive current. Resistor R7 in the main coil return circuit is used to sense coil current which is then applied to current feedback transistor Q11.

VOLTAGE COMPARATOR

The voltage comparator compares the common (junction point) voltage of the main coils with a reference voltage in the comparator. If the UNREG +24V supply for the main coils varies, the output of the comparator will then control the drive transistors so that the voltage at the junction of the main coils will be maintained at one–half the UNREG +24V.

PRE–DRIVES

Three outputs of IC1 (pins 22, 23, 24) to the pre–drive transistors alternately turn–on the drive transistors (Q1~Q9) to provide the correct sequence of current to the main coils which drive the capstan motor.

POSITION DETECTOR

The position detectors are necessary to switch the main coil current sequentially. Hall IC's are used to detect the position of the motor's ring magnet, and generate a 3 phase position signal. This signal is sent to IC1 (pins 11, 13, and 15).

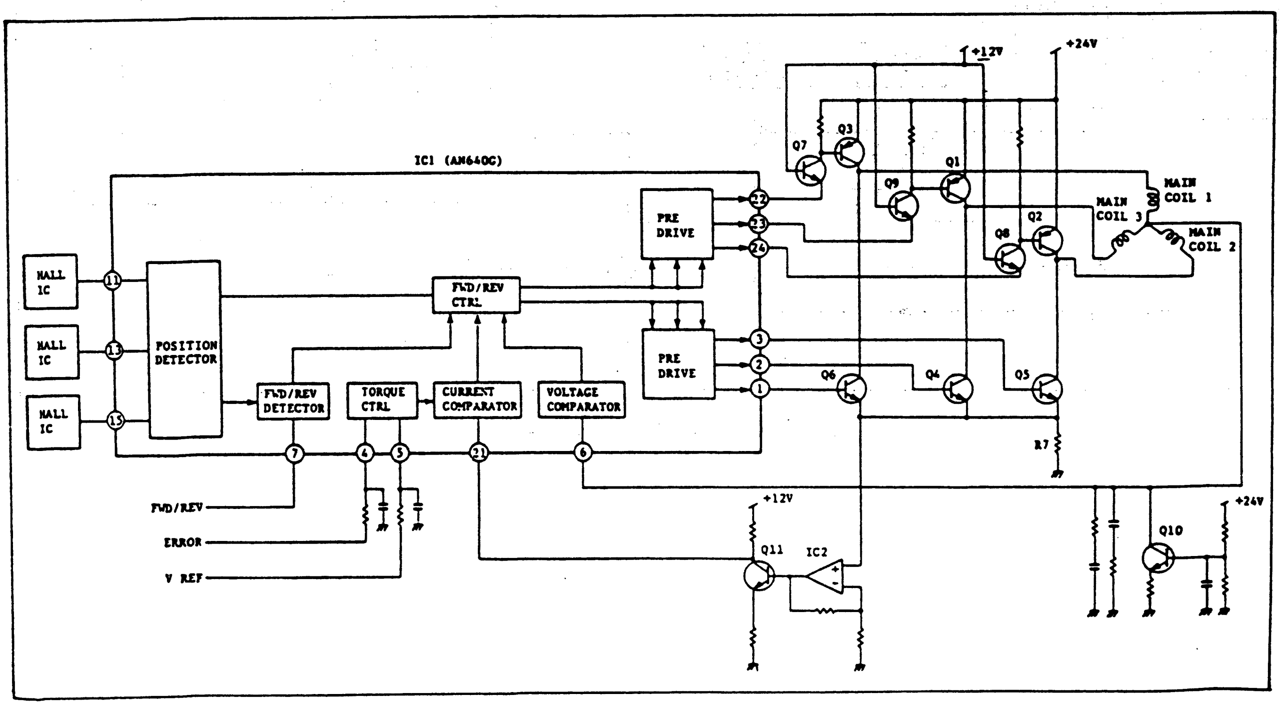


Fig. 4–60 Capstan Motor Drive Circuit

5–32 DRUM MOTOR DRIVE

Refer to figure 5–61. The video head drum motor is a direct drive DC brushless motor. This motor consists of a 12 pole ring magnet, 3 main coils separated into 9 poles, and 3 hall ICs.

TORQUE CONTROL

The DC reference voltage, error voltage from the drum servo circuit is applied to the torque control circuit through IC3 (AN640G) (pin 4 and 5). The torque control circuit compares the reference and error voltage, and then controls the current which is applied to the drive transistors, through the pre–driver circuit. The speed of the drum motor is inversely proportional to the DC voltage at pin 4 of IC3.

CURRENT COMPARATOR

The current comparator compares the current of the main coils with the torque control output, and the output is sent to the pre–drive circuit to control drive current. Resistor R42 in the main coil return circuit provides the measure of coil current which is then applied to current feedback transistor Q16.

POSITION DETECTOR

The position detector is necessary to switch the main coil current sequentially. The position detectors are actually hall ICs, as used in the capstan motor. The hall ICs located on the lower surface of the drum units are facing the upper surface of the ring magnets. So as the drum motor rotates, the poles of the ring magnet will alternately pass over the hall ICs, thus developing the switching sine waves which are applied to pins 11,13,15 of IC3. Position detector information and torque control outputs are then sent to the pre–driver circuit.

MAIN COIL DRIVE

Pins 22,23 and 24 of IC3 sequentially switch drive transistors Q13, Q14, and Q15 which apply current to the main coils to rotate the motor.

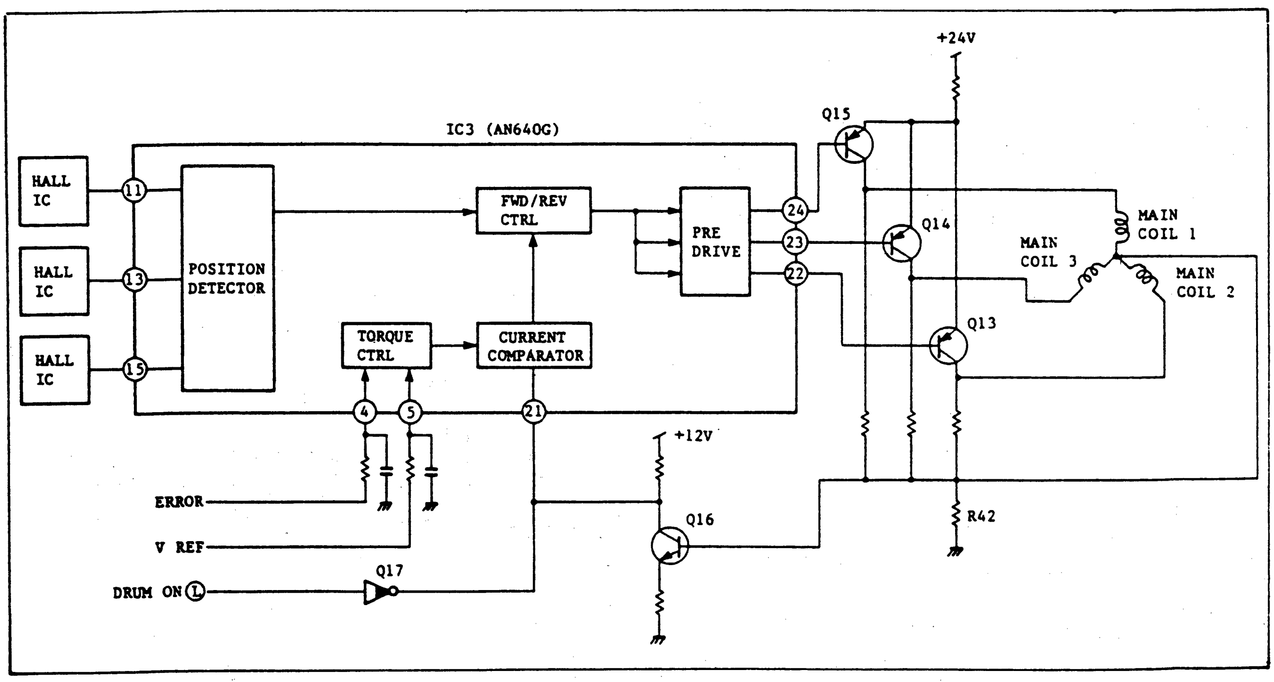


Fig. 4–61 Drum Motor Drive Circuit

4–33 REEL MOTOR DRIVE

The reel motors also uses a brushless direct drive motors. The motor drive circuit consists of two blocks, the motor drive DC amps and the high speed brake circuit, as shown in figure 4–62.

MOTOR DRIVE CIRCUIT

Reel drive control signals from the timing & servo board (L–5), are sent to a DC amp (IC5, Q31 & 32) for the supply reel motor, whereas IC5, Q33, 34 are used for the take–up reel motor.

HIGH SPEED BRAKE CIRCUIT

The high–speed brake circuit is used to brake each reel motor if the stop key is pushed during the FF, REW or X32 shuttle mode.

Brake action is accomplished by connecting the reel motors together and using the counter electro–motive force produced by the rotating motors to quickly slow each other down. In the FF mode, the supply reel and take–up reel motors negative leads are shorted together through resistor R79 and Q30 or R76, Q29, by the brake pulse from system control. The counter electro–motive force from the take up reel motor will now be sent to the supply reel motor causing it to turn in the opposite direction thereby quickly braking the reels. While in the REW mode, Q27 and Q28 along with R69 and R72 are used. 3 logic signals from system control are used to select these transistors, depending on the tapes direction and cassette size.

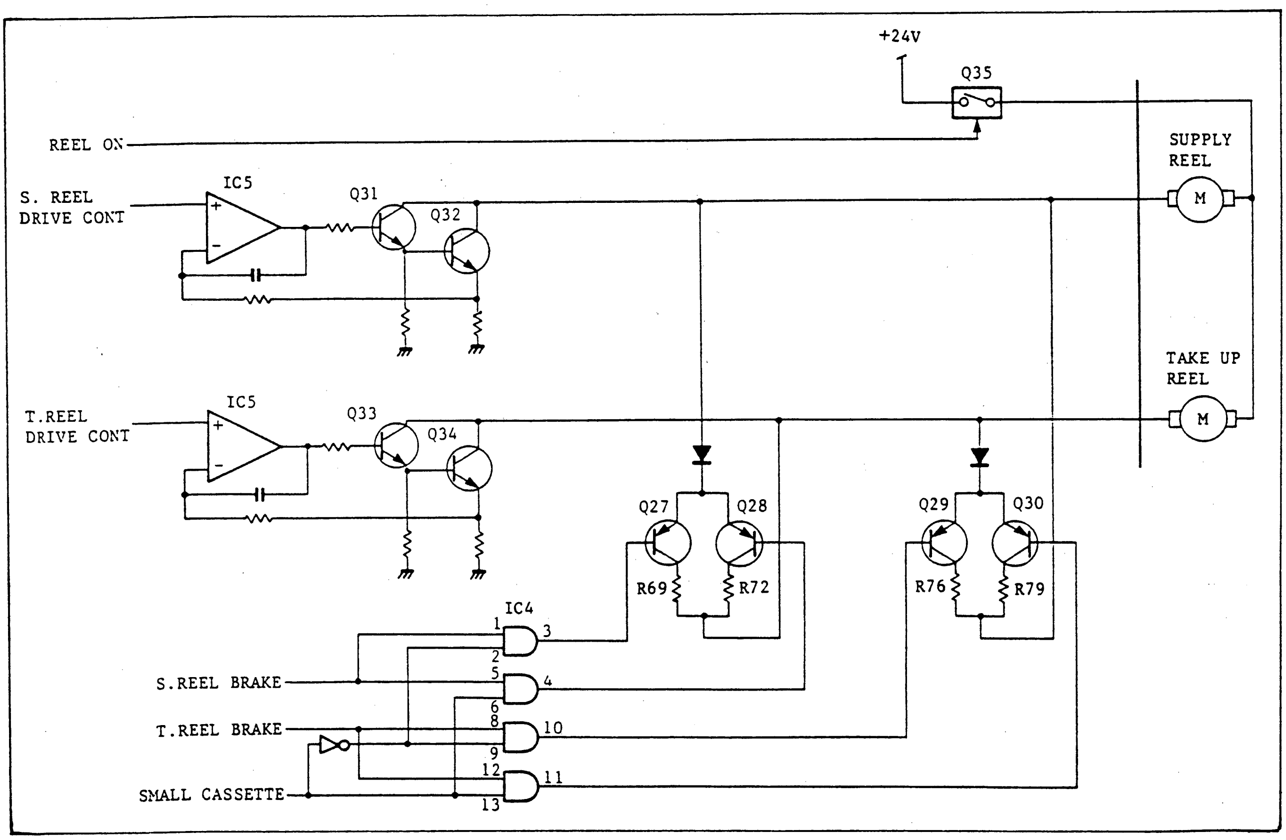


Fig. 4–62 Reel Motor Drive Circuit

6. TIME CODE SECTION

6–1. OVERALL CIRCUIT

To increase tape editing precision, the AU–630 has two types of time code readers and generators. One is the longitudinal time code (LTC), recorded on the tape in a linear fashion. The other type is vertical interval time code (VITC), and is used during slow and still modes.

A block diagram of the time code section is shown in figure 6–1. The Gate Array is a single chip that includes the VITC and LTC readers and generators. Two CPU's one for key input, and one for overall control, are also used.

LONGITUDINAL TIME CODE (LTC)

This time code system records on the tape using a fixed head. LTC is coded into one 80 bit digital word for each frame.
Of these 80 bits, 32 bits comprise the hour, minute, second and frame number. 32 bits are open for use by the user, and the remaining 16 bits form a synchronizing word. This synchronizing word is located at the end of the LTC and indicates the end of the frame. It is also used to detect the direction of the tape travel.

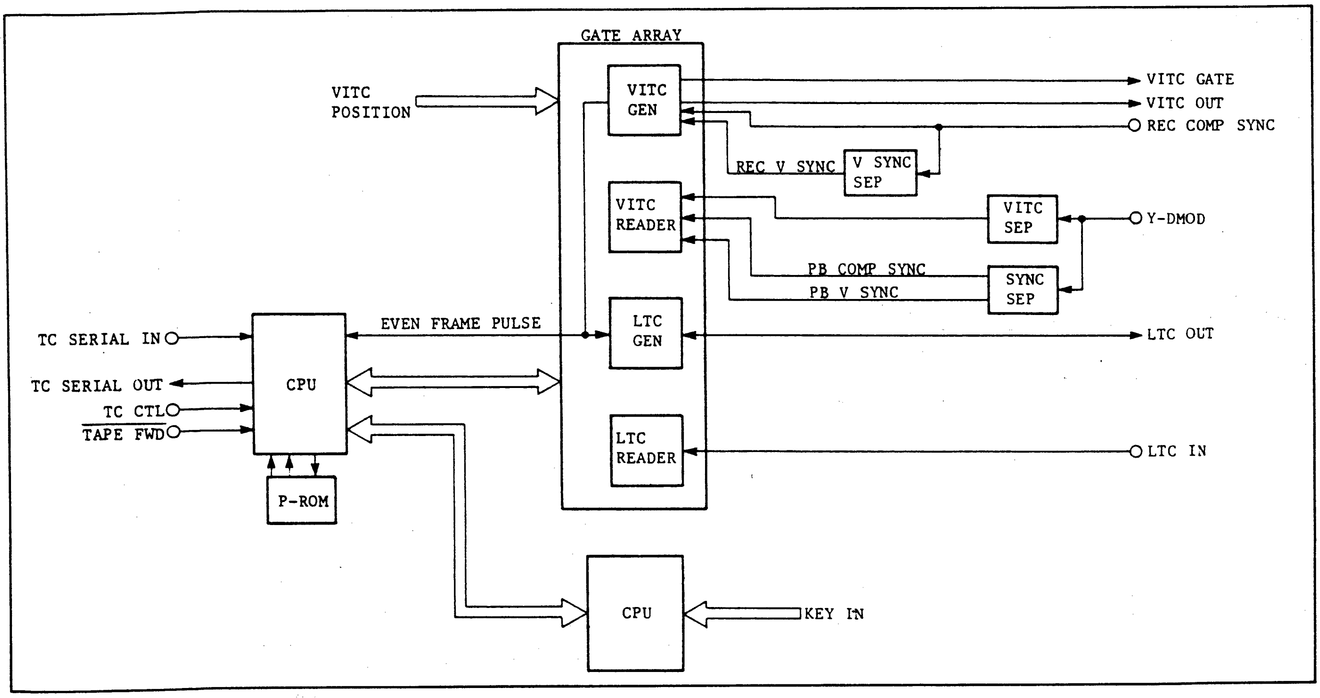


Fig. 6–1 Time Code Block

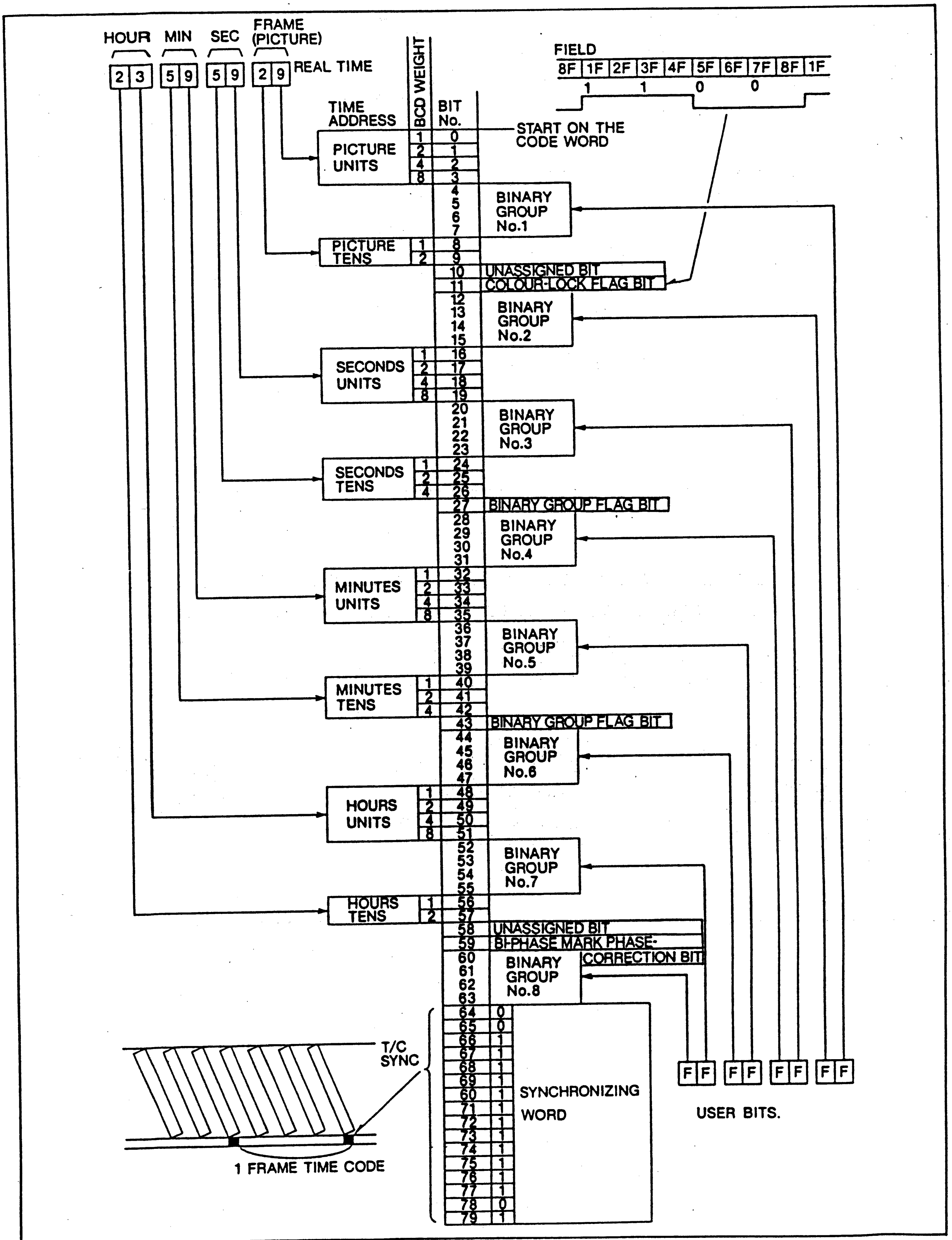


Fig. 6–2 LTC Time Code Format

The LTC modulation system is called a biphase mark system (it is often referred to as Manchester code system), in which there is always a level change, referred to as a "clock transition", at the end of each bit. There is also a level change, referred to as an "intermediate transition" in the middle of the bit period, when the bit is a "1" (high). Figure 6–3 shows the waveforms of the biphase mark modulation system.

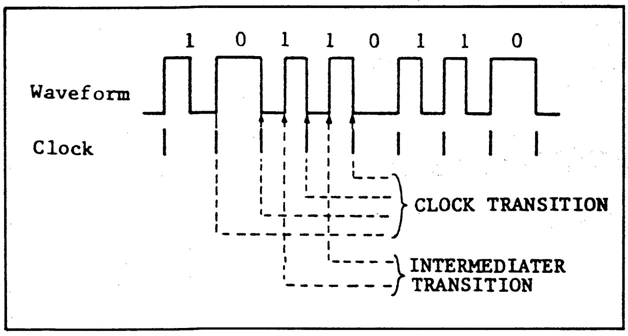


Fig. 6–3 Bi–Phase Mark

VERTICAL INTERVAL TIME CODE (VITC)

This system inserts the time code in the vertical blanking period of the video signal, to facilitate reading of the time code, even in the still and slow modes. It uses the same time code data as the LTC system of which 64 bits are divided into 8 Bit units. The code also includes a 18 bit synchronizing code and an 8 Bit cyclic redundancy check (CRC) code, to make a total of 90 Bits. In the AU–630, this code is inserted in the vertical blanking period of the Y signal. The time code is repeated four times during each frame to minimize the effect of drop outs etc.. The format is shown figure 6–4.
The modulation system used in this VITC system is a modified non return to zero (NRZ) system in which transition occurs only when there is a change in adjacent bits. This transition can be from either a high to a low, or a low to a high (1 to 0, or 0 to 1). A condition of low to low, or high to high (0 to 0, or 1 to 1), is not considered a transition. The basic clock used is approximately 1.79MHz, which is 455/4, of the horizontal frequency.

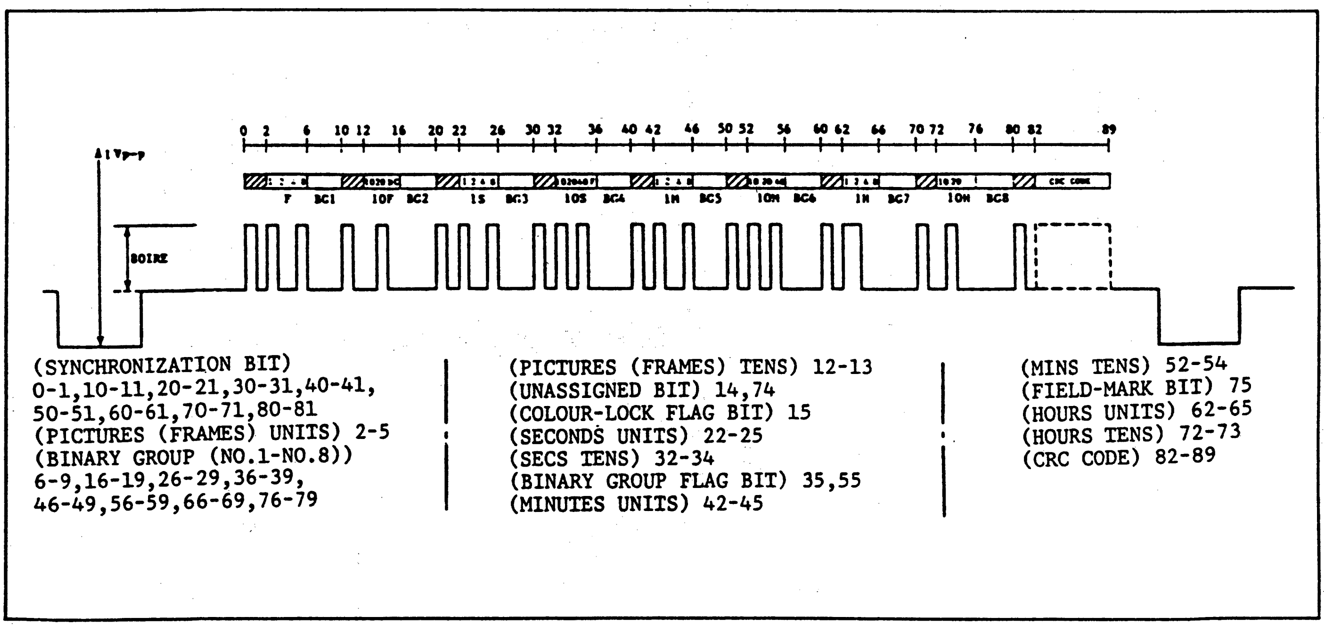


Fig. 6–4 VITC Format

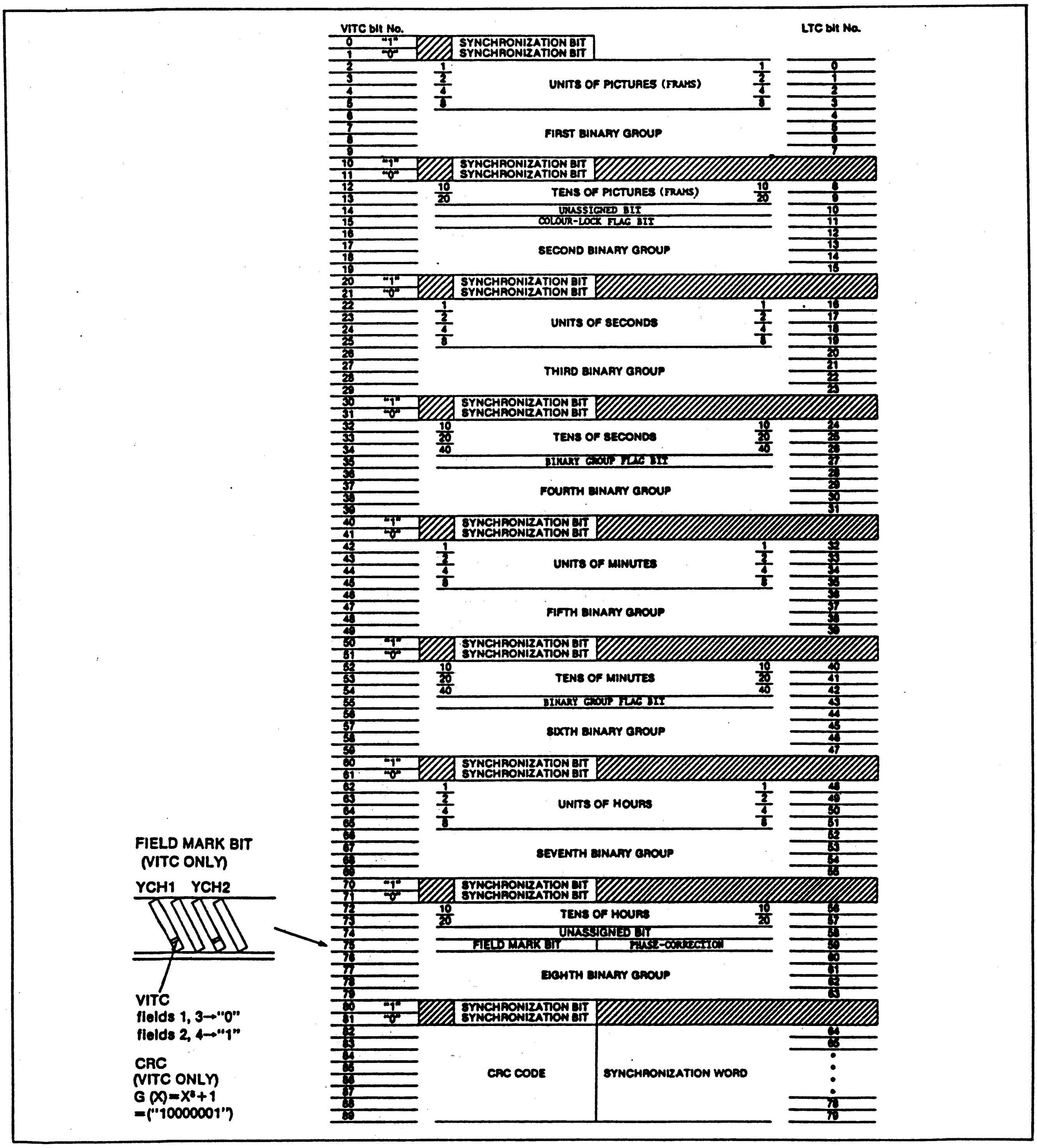


Fig. 6–5 VITC/LTC Comparison Chart

CYCLIC REDUNDANCY CHECK (CRC) CODE

The error checking system used here performs the operations in the data, and adds the characters obtained, then records it. The presence of an error during playback, is checked by performing the same operations again.

The advantages of this system are that the circuit can be made relatively simple, errors can be detected with high efficiency, even in long data streams. Burst errors can be detected particularly easily. The CRC code used in the VITC adds the code formed by:

G(X) = X [to the 8th power] + 1
= ("10000001")

TIME CODE SECTION

DETAILED DESCRIPTION

This cicruit comprises VITC and LTC readers and generators, composed of a special purpose time code gate array. The fundamental functions are:

1. VITC generator
2. VITC reader
3. LTC generator
4. LTC reader

Auxiliary functions are:

a. user bit access
b. drop frame/non drop frame switching
c. INT/EXT time code switching

Front sub-panel control switches

a. VITC line selection
b. Real time generator
(LTC user bits/VITC user bits)
c. EXT T/C regenerator (user bits)
d. Free run/REC run switching

Below is a detailed description of the circuit. The gate array, newly developed for the MII, has built-in LTC and VITC readers and generators. Figure 6-6 shows an internal block diagram of the gate array. It is divided into five main blocks. The VITC generates a time code signal that is locked to composite sync, sent from the REC circuit, based on such data as the position of the VITC, etc.. At the same time, it generates a gate signal, which it sends to the REC circuit, where it is inserted in the vertical blanking period of the Y signal. The VITC reader extracts the VITC signal from a signal suppled from the Y playback circuit, and reads the time code data from this signal. The LTC reader and generator operate in an identical manner.

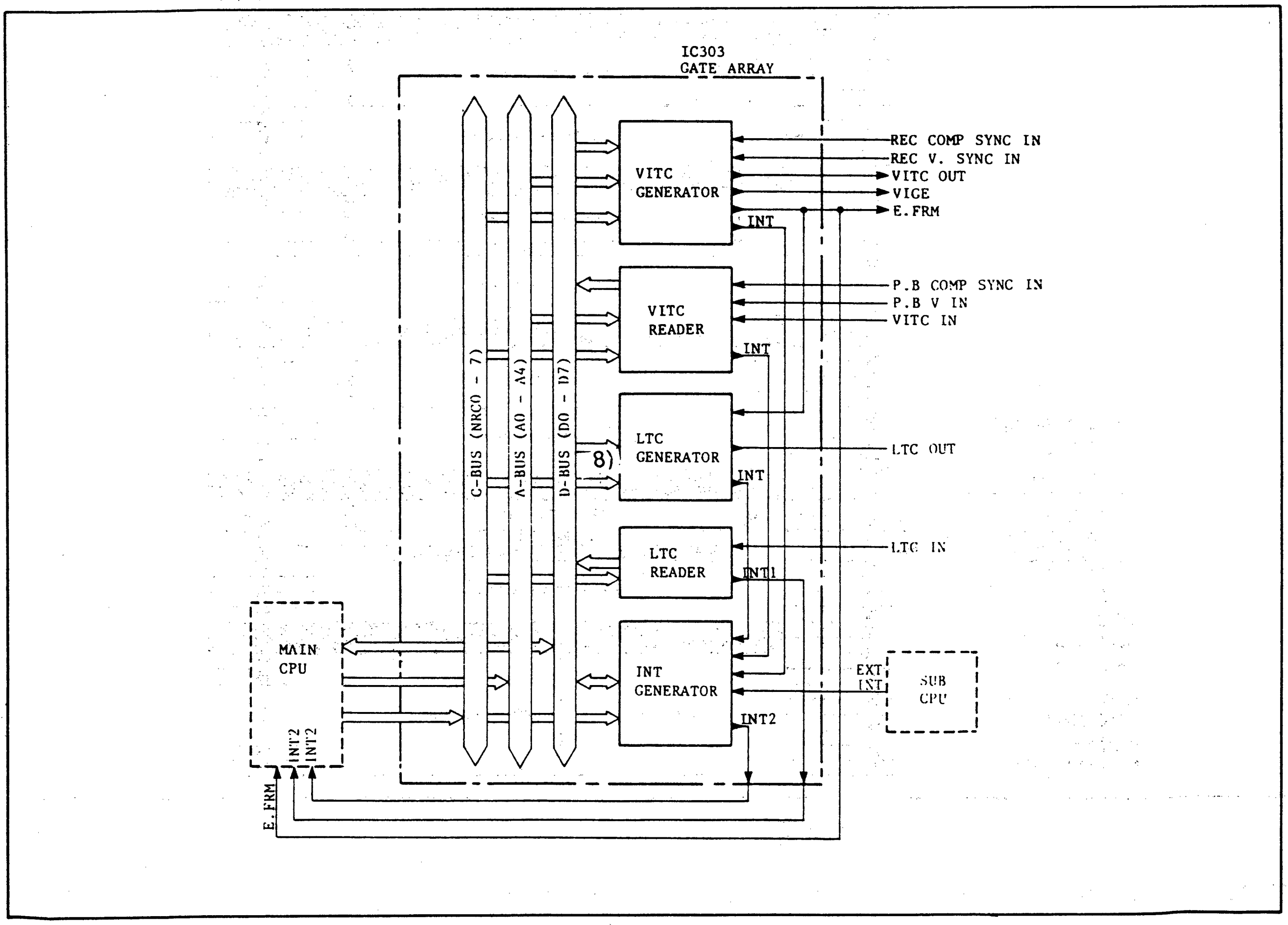


Fig. 6–6 Time Code Gate Array

This gate array uses an external CPU (IC301) as the main CPU, by which all data is controlled. Basically, all operations are performed using an interrupt as the trigger. There are two types of interrupts on the main CPU, they are INT1 and INT2. INT1 is a signal generated by the LTC reader, and is output each time the reader reads 16 bits of input LTC.

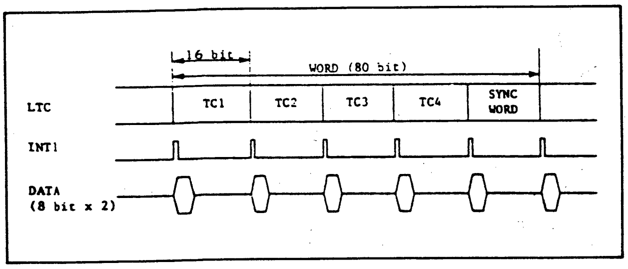


Fig. 6–7 LTC Reader Data Timing

INT2 is sent to the CPU when one of the three internal interrupts, or the external interrupt (EXT INT) (from the SUB–CPU), signal is generated.

6–2. VITC READER AND GENERATOR SECTION

The function of the VITC section is to read the VITC from the video signal, comming from the Y playback circuit. Figure 6–8 shows the timing chart for VITC input and output.
The reader detects the position of the VITC by separating composite sync and V sync, from the Y playback signal.

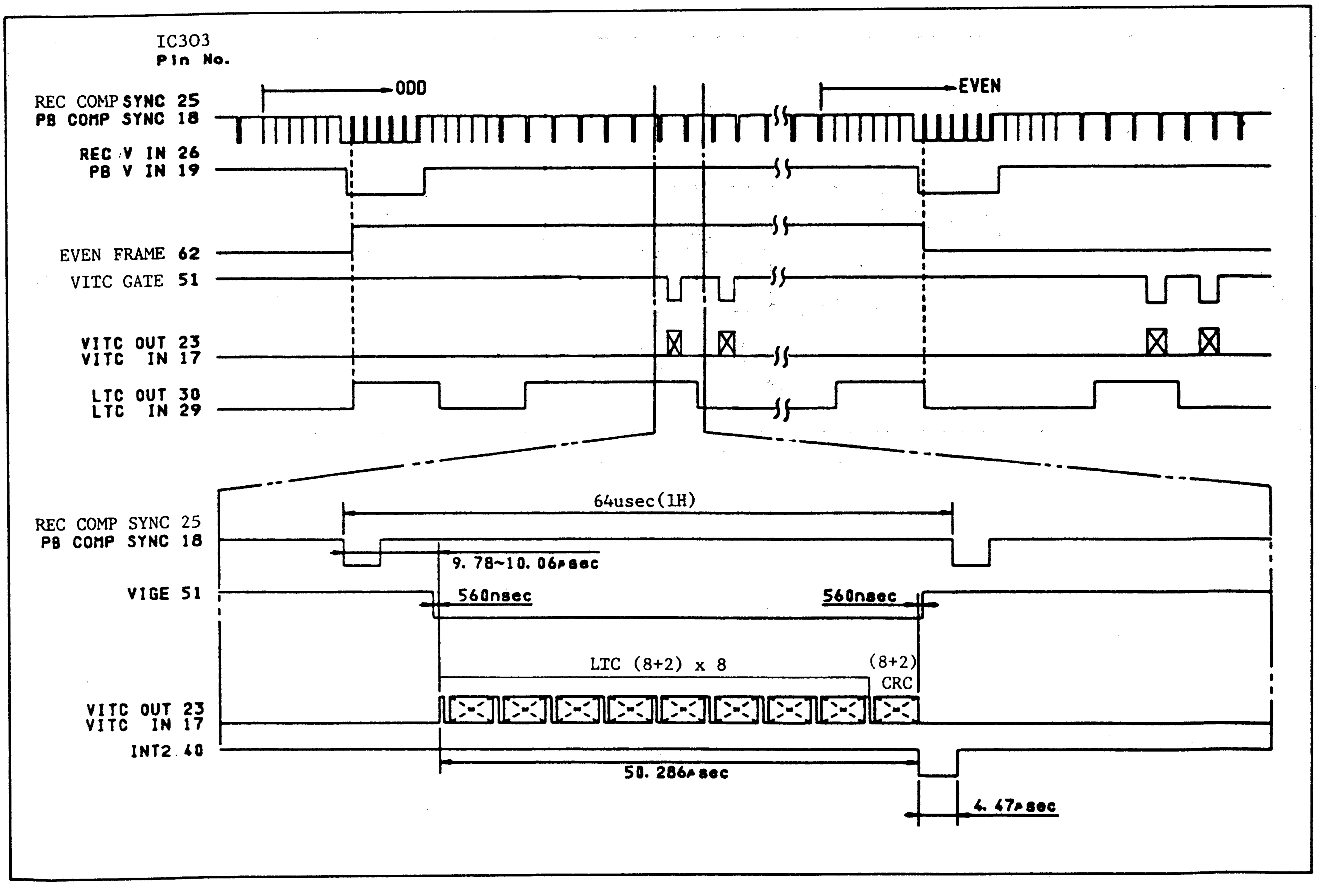


Fig. 6–8 VITC Input Output Timing

The input signal, as shown in figure 6–9, is supplied to the sync separator circuit, and to the VITC separator circuit. Figure 6–9 is the VITC separator circuit, where the VSC signal is trapped (4.43MHz) by C358 and L302.

These three signals are sent to the gate array, where the VITC is read. When read, the interrupt signal (INT2) is sent to the main CPU. When the main CPU receives this signal, it generates a control signal to receive the data.

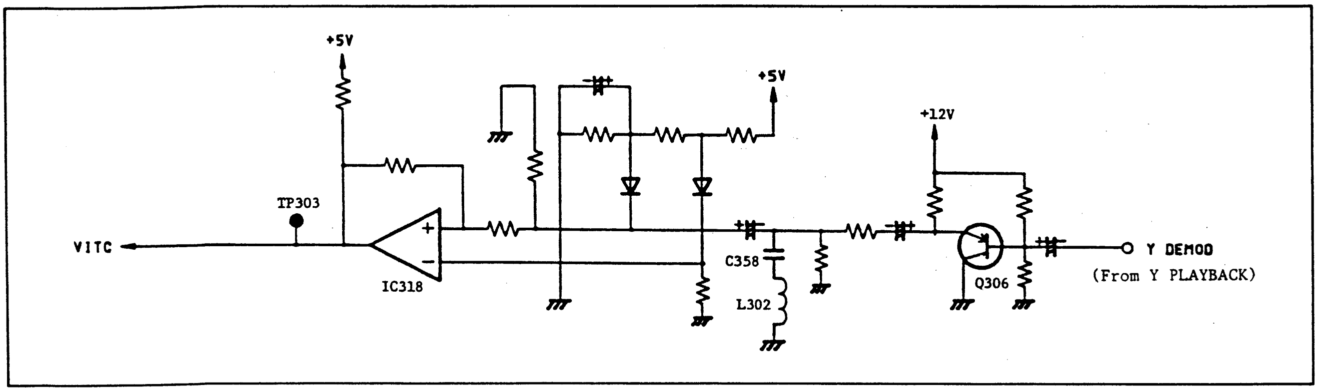


Fig. 6–9 VITC/SYNC Separator

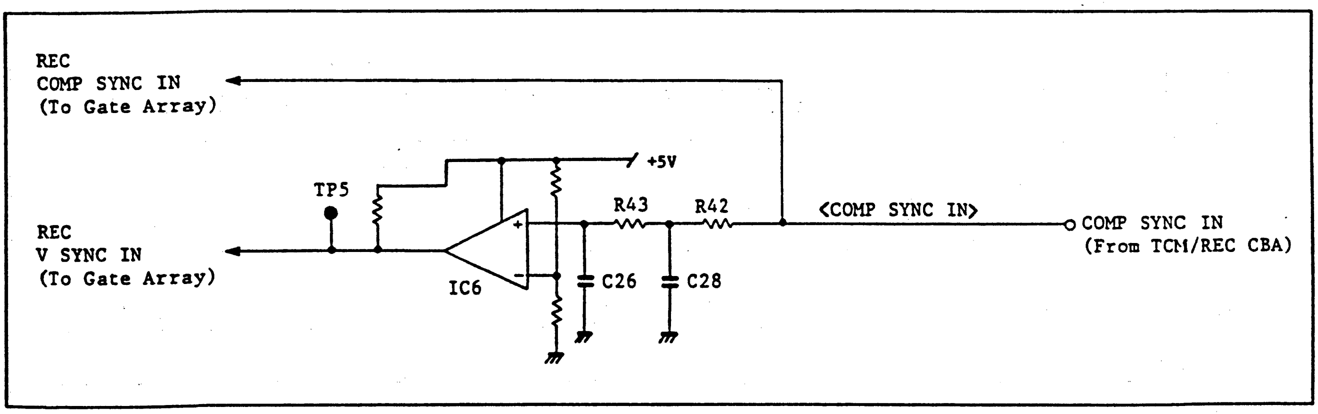


Fig 6–10 REC V Sync Separator

6-3. LTC READER AND GENERATOR SECTION

The function of the reader is to follow the speed of the input LTC signal and read it. To accomplish this, switching of the internal system clock is done in accordance with the frequency of the LTC clock signal. When the LTC is read, the interrupt signal (INT1) is generated to prompt the main CPU to read the LTC data. The function of the generator is to generate an LTC signal, in sync with the time code data from the main CPU, and the even frame signals, from the VITC generator.

The LTC input circuit switches the EXT TC, the playback TC and INT TC signals by IC1. These switching signals are sent from the system control circuit by serial data, and are controlled by the main CPU.
Likewise, the LTC output circuit switches the EXT TC and the playback TC signals (IC306), by data sent from the system control circuit.

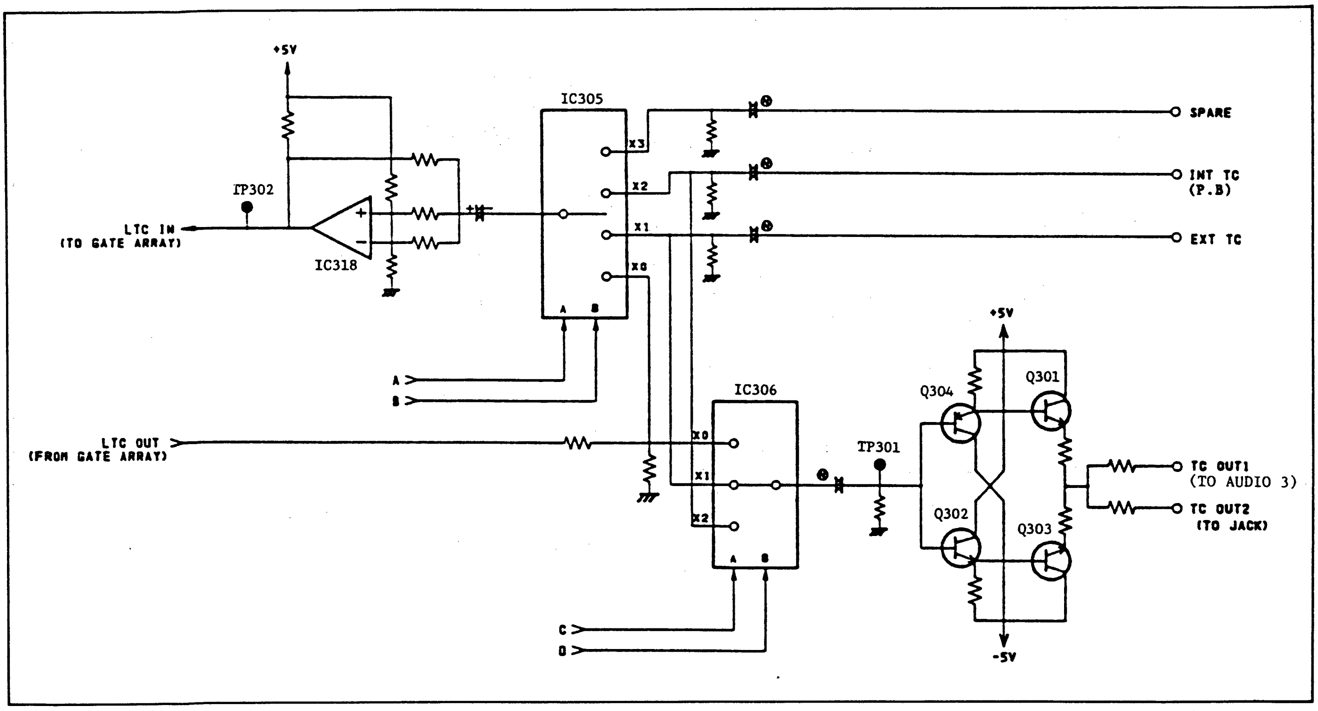


Fig. 6–11 LTC Input Output Circuit

6-4. SUPERIMPOSE CIRCUIT

This circuit superimposes the time code on video output 3. Its timing is determined by the VD and HD signals, output from the TBC–1 sync generator, controlled by 7 bits. These are DA0 to DA6, of the control data from the main CPU, when the load instruction (LD1) signal goes low.
Figure 6–12 shows the superimpose circuit. The internal clock frequency (5MHz) is adjusted by VR301, to permit adjustment of the superimposed horizontal position.

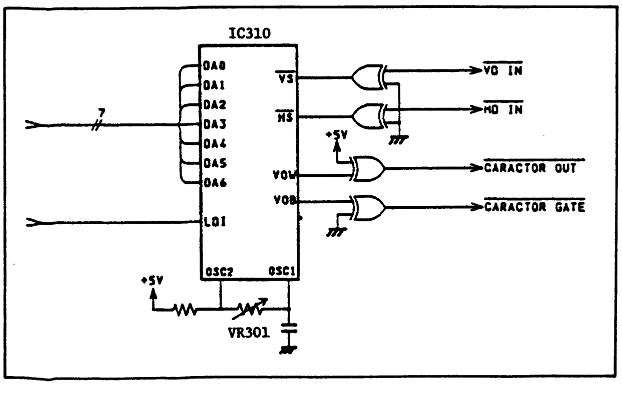


Fig. 6–12 Superimpose Circuit

6-5. BACK UP CIRCUIT

This circuit includes a nickel cadmium battery, capable of backing up the power supply of the time code section for approximately one day. This back up circuit protects the data entering the CPU (IC304). The protected data includes the real time T/C data, the LTC generator data, and the LTC/VITC user bit data. Figure 6–13 shows the circuit.

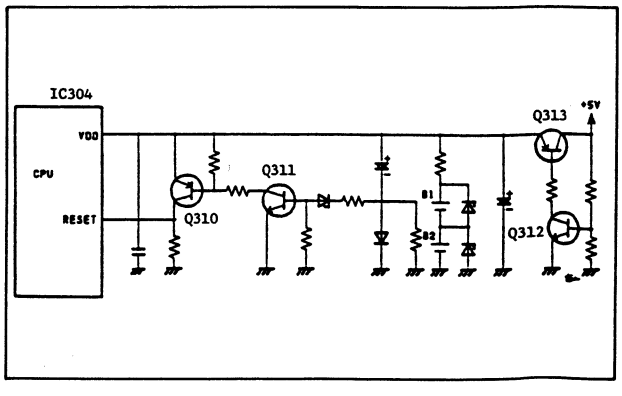


Fig. 6–13 Back Up & Reset Circuit

7. HEAD AMP, PB AMP (S5)

7–1. Head Amp Circuit

Fig. 7–1 shows the Head Amp circuit from the R/P Heads. The playbacked RF signal from the heads is supplied to the head amp circuit Q1–Q3 then the signal is supplied to RF processing circuit Playback part. Y–CH1 and C–CH1 and CH2 are identical to Y–CH1.

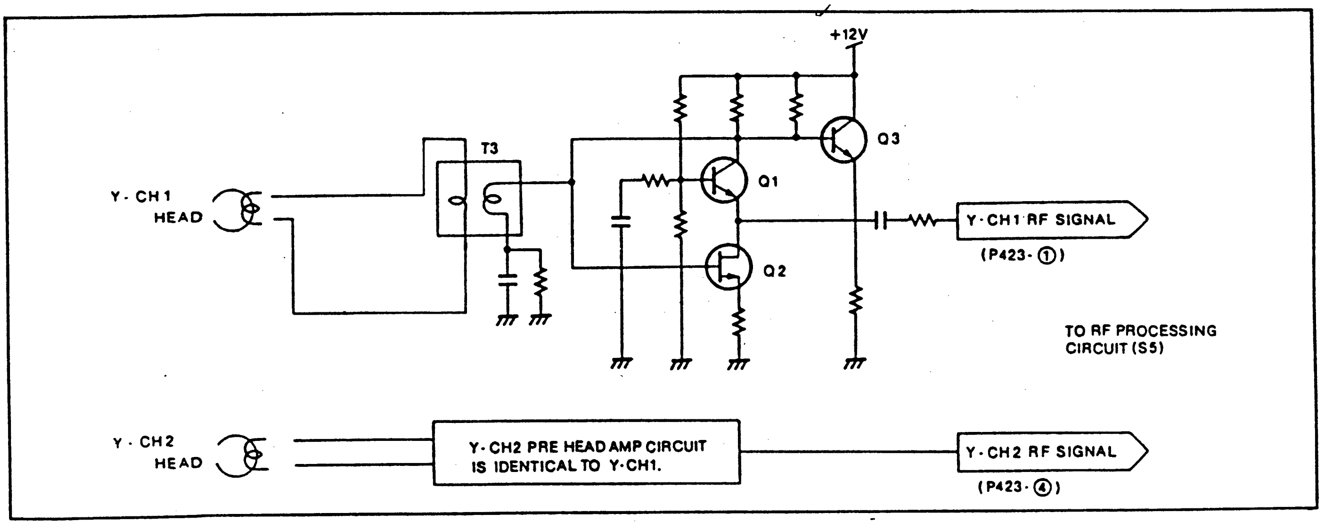


Fig. 7–1 R/P Head Amp circuit

7–2. RF PLAYBACK PROCESS CIRCUIT (S5)

Fig. 7–2 shows the R/P head amp block diagram. This circuit is used for Y and C head amp. They are almost same circuit so only Y head amp will be described.
The RF signal from the R/P head through Head amp circuit is supplied to the main head amp circuit in the RF Processing board (S5 P.C. Board).
Y Head CH1 signal is supplied to 8B and Y Head CH2 is supplied to 9B. They are amplified by transistors Q1 and Q2, and supplied to IC1.

IC1 performs amplification and head switching and CH1 and CH2 mixing.
Y Head switching signal is supplied from 10B to IC1 – pin12 . The output signal from head switching circuit in IC1 is mixed and supplied to a Equalizer circuit and it is amplified and the output signal is supplied to Y Playback circuit (S4 P.C. Board) from 6B.

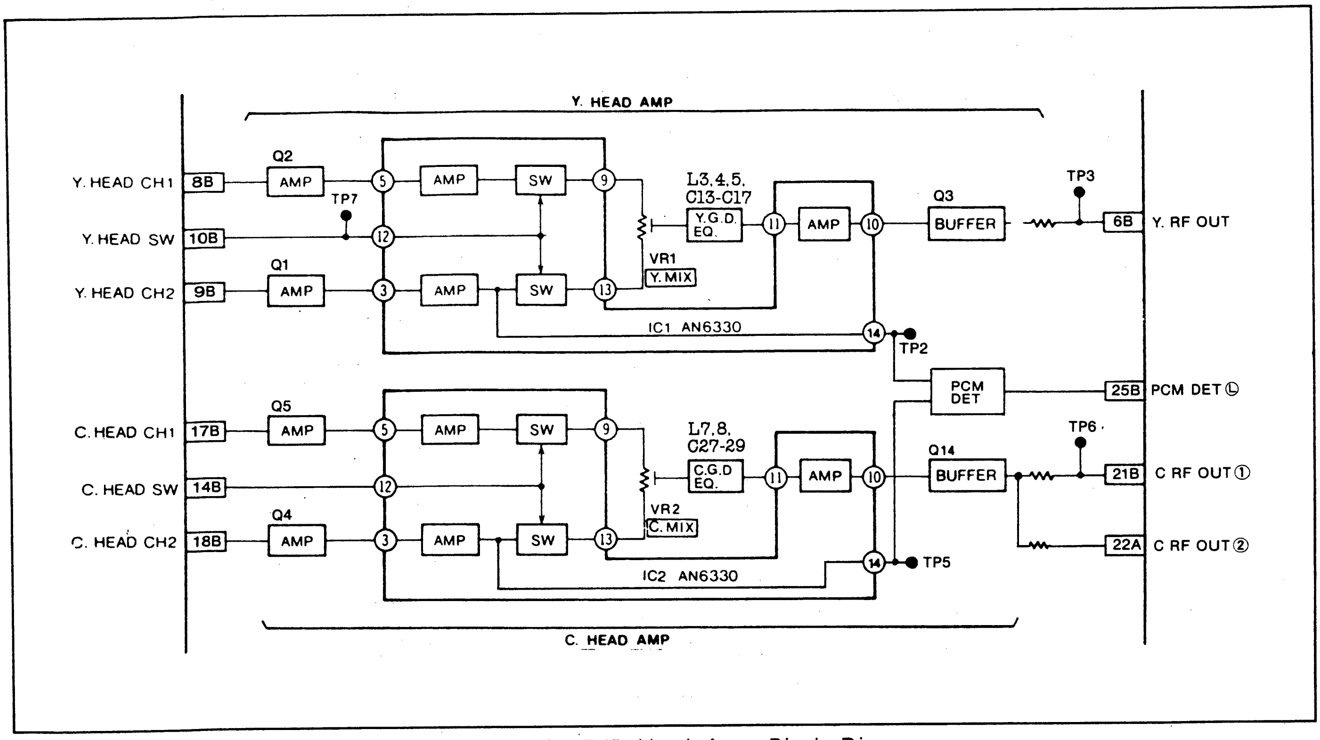


Fig. 7–2 R/P Head Amp Block Diagram

8. Y PLAYBACK (S4) and C PLAYBACK (S3)

<GENERAL DESCRIPTION>

These circuits provide cosine correction, RF equalization, FM demodulation and drop-out pulse generation for playback RF.
Because the Y and C circuits are similar, only Y circuit will be described. The exceptions will be noted accordingly.
Refer to the block diagram in figure 8-1. The playback circuit consists of five main sections.
These are :

1) Cosine correction
2) FM demodulation
3) De-emphasis
4) Drop out detection/pulse generation
5) Tracking (RF) meter drive (only in Y playback)

<DETAILED DESCRIPTION>

8-1 Cosine Corrector
Playback RF from the head amp is input to IC1, which is switched between the two by the R/P HEAD (L) command from the system control. The output of IC1 is input to one of two cascaded cosine correction circuits.
This is shown in Figure 8-1. This signal is split into two paths after buffers Q1 and Q2. The first, through delay line DL1 (55nsec), has a fixed response of 9.1MHz. The second path through IC2 provides a response, variable by +/- 6dB, by controls VR13 and VR14. The output from IC2 is input to the second cosine correction and similarly split into 2 paths. The first, through DL2 (32nsec) has a fixed response of 15.6MHz. The response of the second path is variable by +/- 6dB. These signals are mixed at Q7. Note that the Y channel equalization adjustments are available by the volume on the front pull-out drawer.

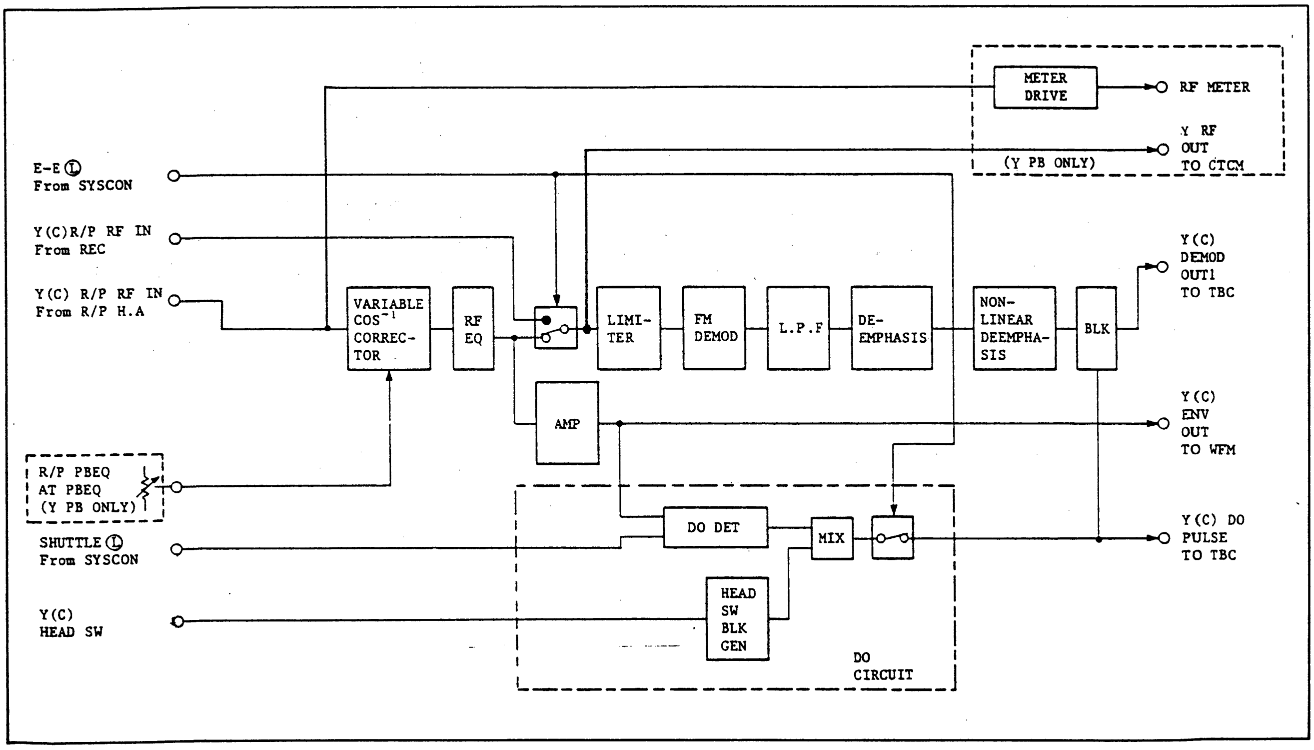


Fig. 8-1 Overall Block Diagram of Playback circuit

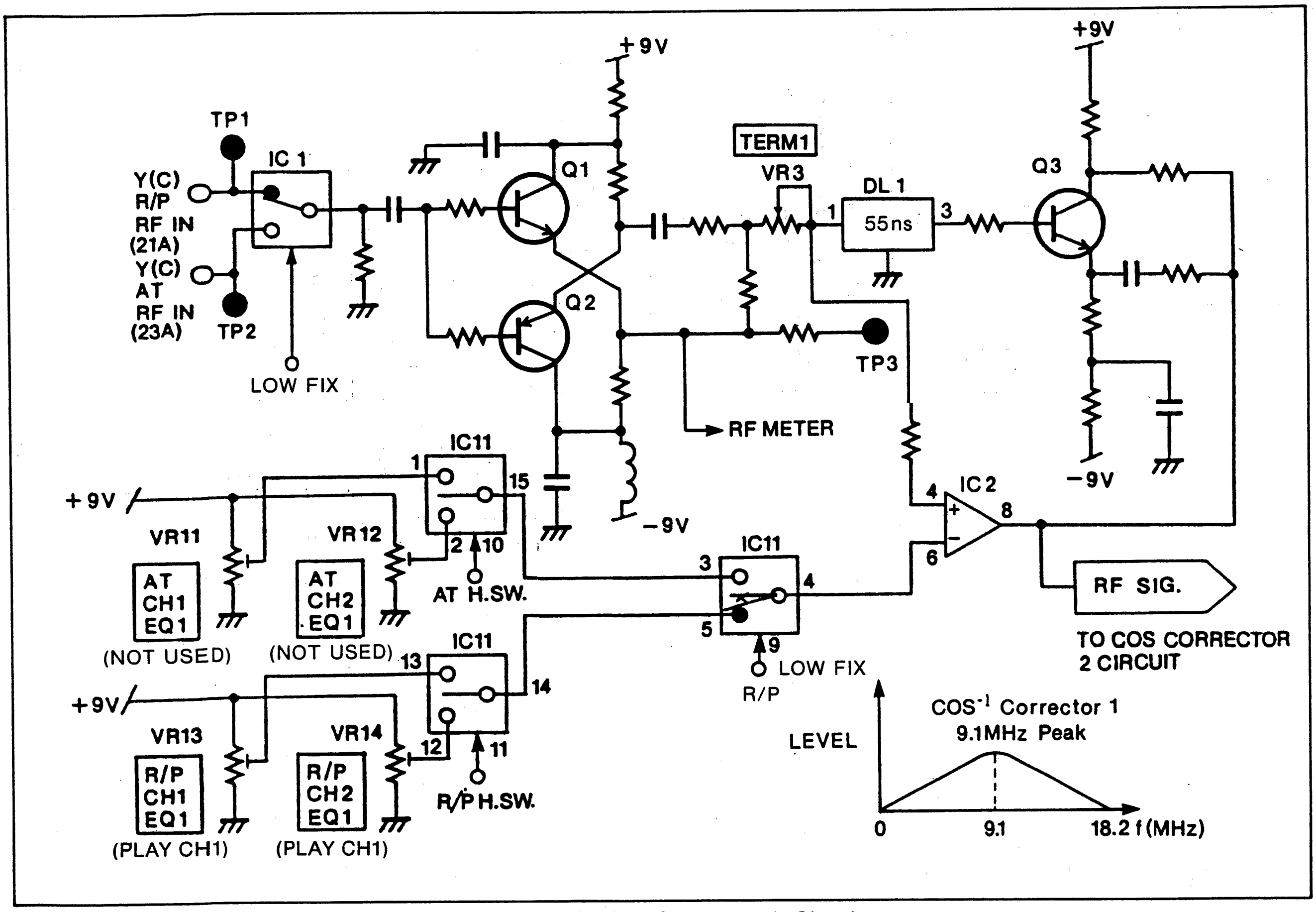


Fig. 8–2 Cosine Corrector 1 Circuit

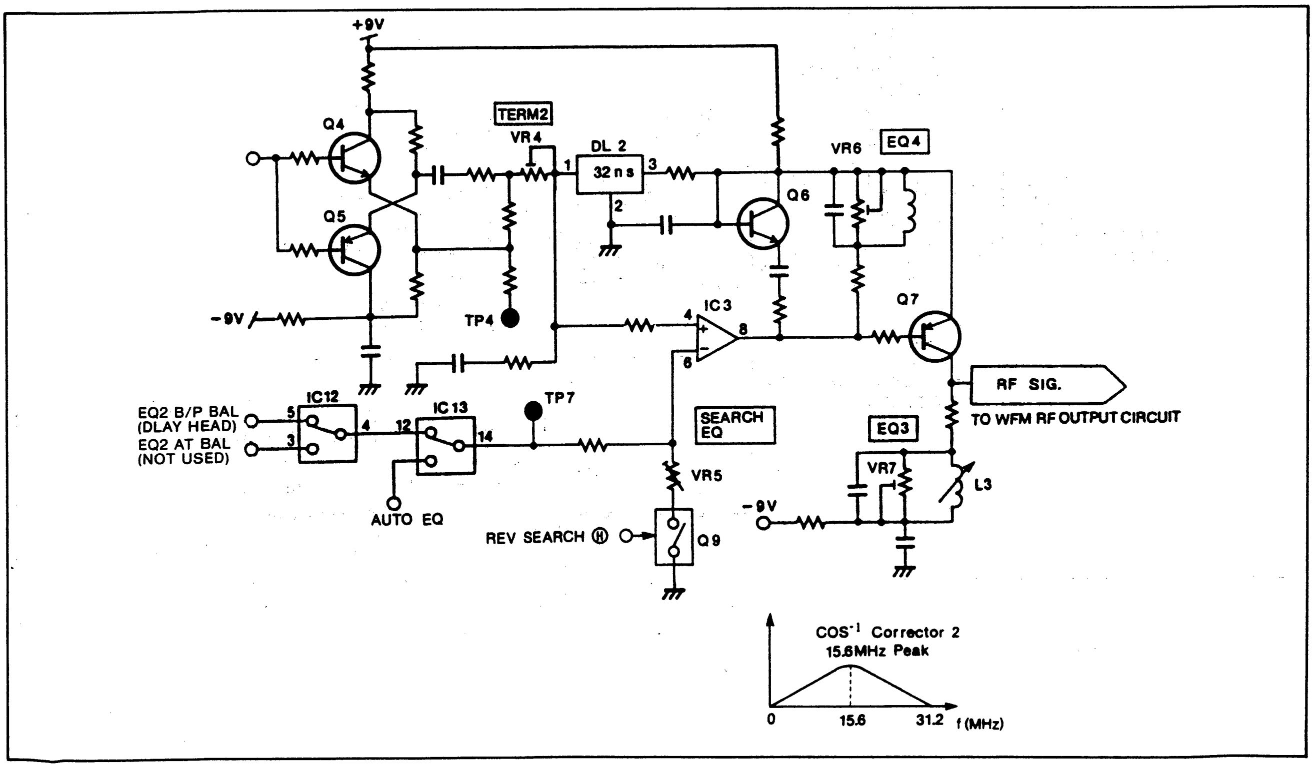


Fig. 8–3 Cosine Corrector 2 Circuit

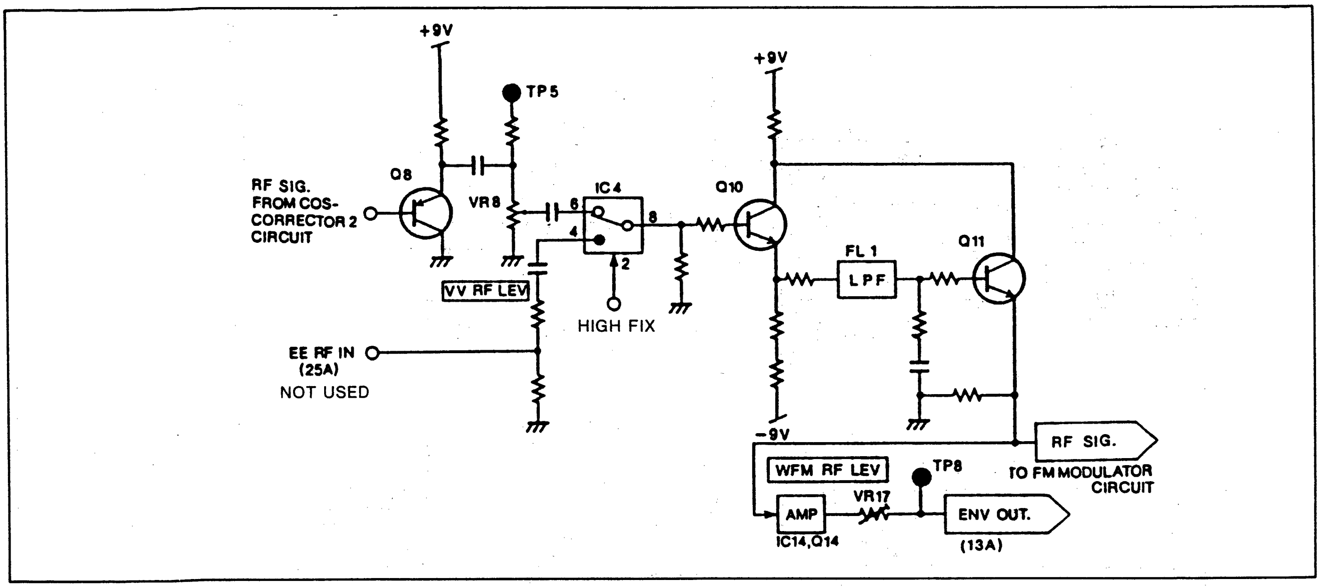


Fig. 8–4 WFM RF Output Circuit

8–2. FM DEMODULATOR

Playback RF signal is supplied to IC4. Refer to Fig. 8–4.
The output of IC4 is supplied to LPF FL1 through buffer Q10. Then the signal is supplied to a buffer Q11. The output of Q11 is separated 2 ways. The first is supplied to the RF equalizer circuit and the second is amplified by IC14 and Q14, then it is supplied to the WFM RF out terminal.

Refer to figure 8–5. Corrected RF is fed into a limiter circuit consisting of IC6 and IC7, which provide suppression of modulation noise.
IC8 provides demodulation and demodulated signal is supplied to amplifiers Q30 and Q31, then the signal is supplied to LPF FL2 which reduces of the unwanted noise.
The output signal is supplied to the DE–Emphasis circuit.

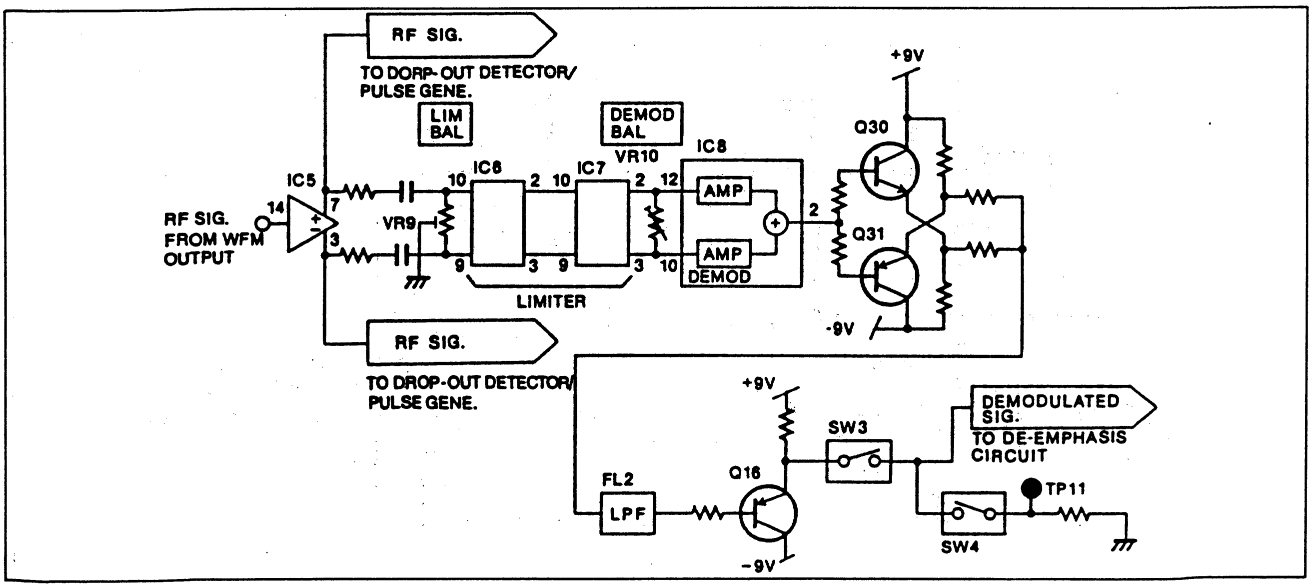


Fig. 8–5 FM Demodulator Circuit

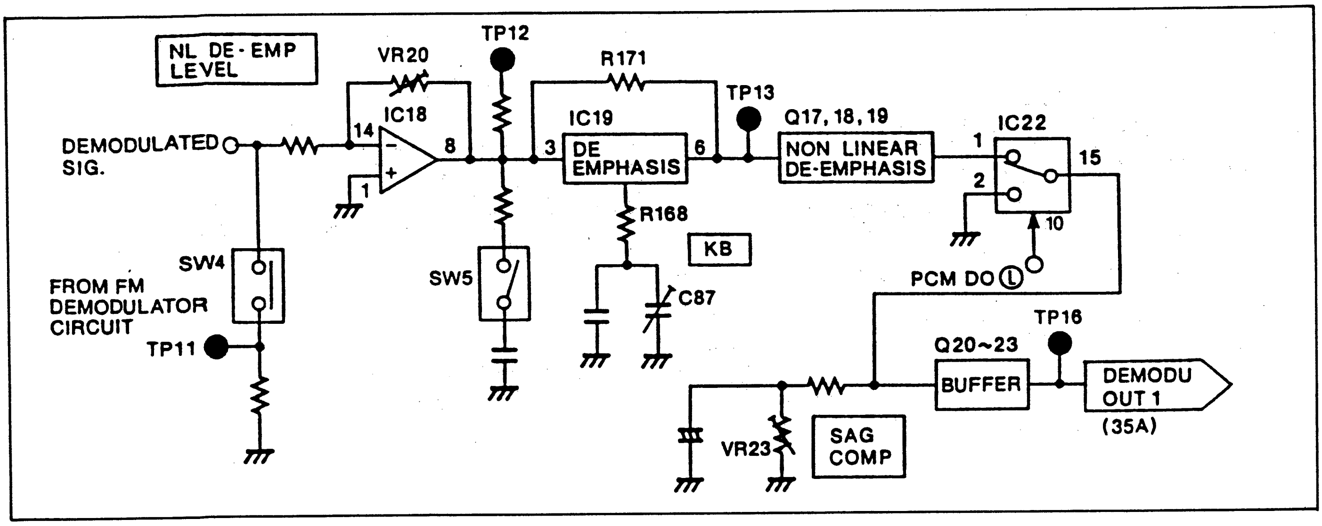


Fig. 8-6 De-emphasis Circuit

8-3. DE-EMPHASIS

Refer to figure 8-6. Because the video signals have been emphasized before recording, it is now necessary to pass them through the de-emphasis circuit. This will improve the overall S/N ratio. An RC network is formed by IC18 and other CR. The de-emphasis network is, in effect, the opposite to the emphasis used in the recording process. The de-emphasis preset circuit comprises IC19, and the Non-linear de-emphasis circuit is composed of Q17-Q19.

8-4. DROP-OUT DETECTOR/PULSE GENERATOR

This circuit monitors playback RF, and generates a drop-out pulse when the envelope falls below a set threshold. It also forms a blanking pulse to mask the head switching noise.
The following refers to figure 8-7. The input RF is amplified by IC5. The output of IC5 is supplied to IC15, Drop-out detector. The detected signal is filtered by L10, C70, C71 and C72. The detected signal is supplied to the Drop-out pulse generator IC16. This drop-out pulse and head switching pulse are mixed at IC17 and supplied to the terminal 9A through IC17. DO PULSE PCM Drop-out pulse is also mixed and supplied to the 9A.

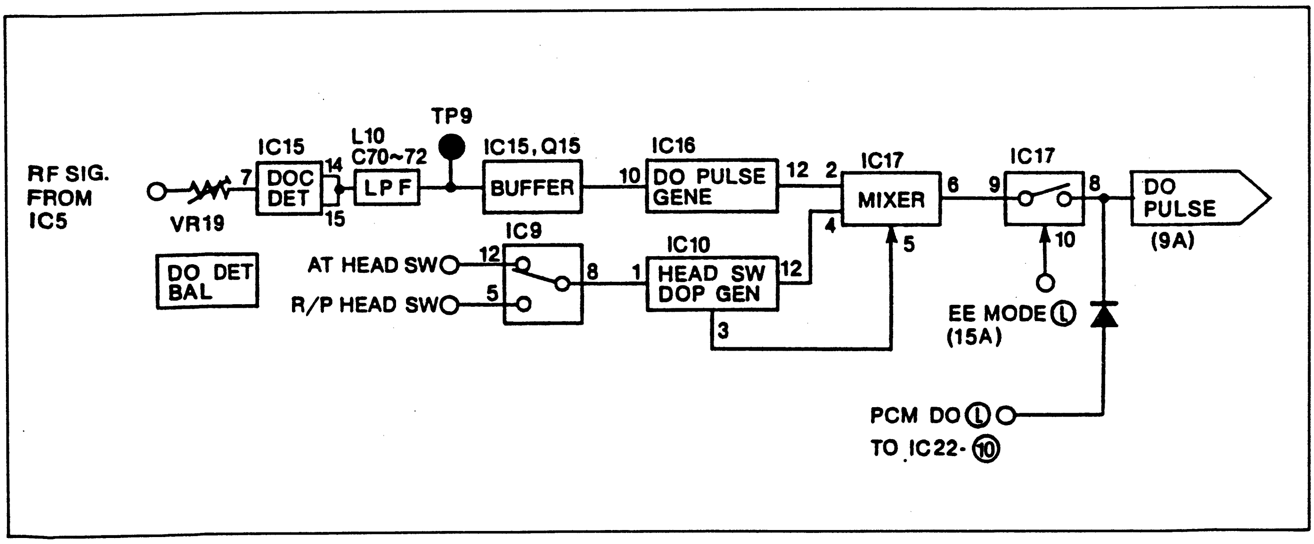


Fig. 8-7 Drop-out Detector/ Pulse Generator Circuit

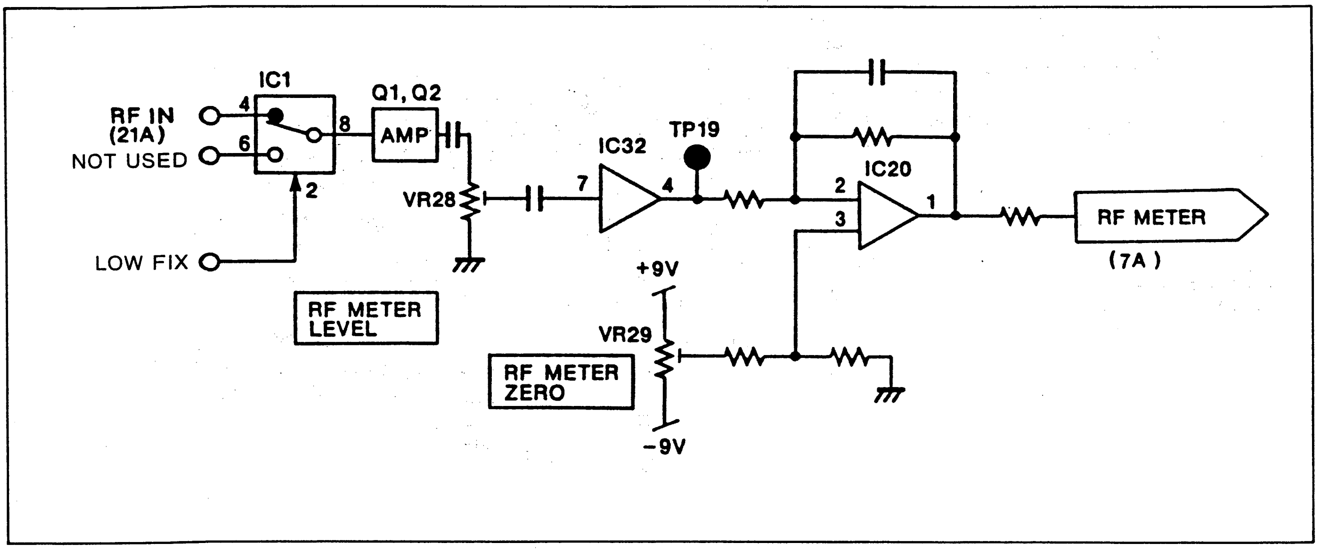


Fig. 8–8 RF Meter Circuit

8–5. RF METER CIRCUIT

To give the most critical tracking meter indication, the luminance RF envelope is utilized. This circuit is for luminance circuit only.
This circuit detects the RF level of head head depending.
The RF is amplified by Q1 and Q2, then supplied to IC32. The RF level is adjusted by VR28 (RF METER LEVEL). The signal is amplified by IC32 and supplied to IC20. The meter zero point is adjusted by VR29 (RF METER ZERO).
The signal is supplied to the Terminal 7A (RF METER).

9. TIME BASE CORRECTOR (TBC)

GENERAL DESCRIPTION

The Time Base Corrector circuit consists of three main P.C. boards, TBC1 (L1), TBC2 (L2) and ENCODER (L3). The main function of the TBC is to reduce jitter of the playback video signal.
The TBC Overall Block Diagram is shown in Fig.9–1.

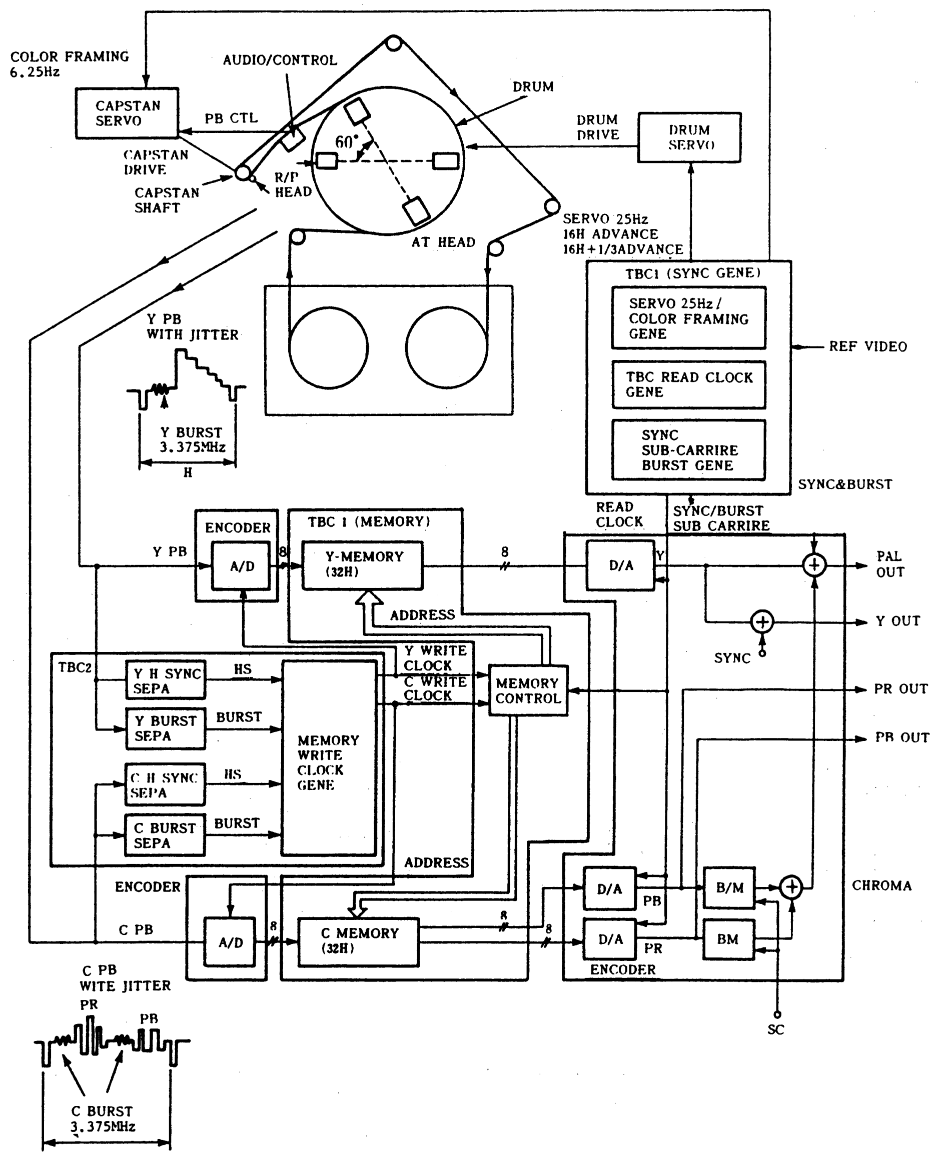


Fig. 9–1 TBC OVERALL BLOCK DIAGRAM

The playback Y and C signals are supplied to the A/D converter of the Encoder and changed to digital signal (Y: 8 bit, C: 8 bit), which are memorized in Y and C memories of TBC1 respectively. These memories can store 32H digital video signal data. During first 16H period only memory writing is possible, and from 17H memory reading is started, so the video signal read from the memory is 16H delayed from the playbacked video signal. The memory read Y and C signals are supplied to the D/A converter on the Encoder board to get analogue video signals. In case of the C signal two D/A converters are used. They are necessary to convert conpressed Pb and Pr signals to normal Pb and Pr signals. The output signals from D/A converters are component signals Y, Pb and Pr. The PAL composite video signal is also generated on the Encoder circuit.

Pb and Pr signals are supplied to the Balanced Modulators. They are mixed with sub–carrier signals and a chrominance signal is obtained. The Chrominance signal and Y signal are mixed, then sync and burst signals from the SYNC GENERATOR of TBC1 are mixed, and as a result the Composite PAL video signal is obtained.

9–1. SYNC GENERATOR SECTION

9–1–1. General Description of Sync Generator

This circuit is on TBC–1 PC board, and mainly generates synchronization signals. A gate array gives the circuit the following 4 functions.

(1) Servo reference signals
(2) Various synchronization signals and sub–carrier
(3) TBC read start signal and read clock
(4) Colour framing reference 6.25Hz

The Block diagram for the entire circuit is shown in Fig. 9–2.

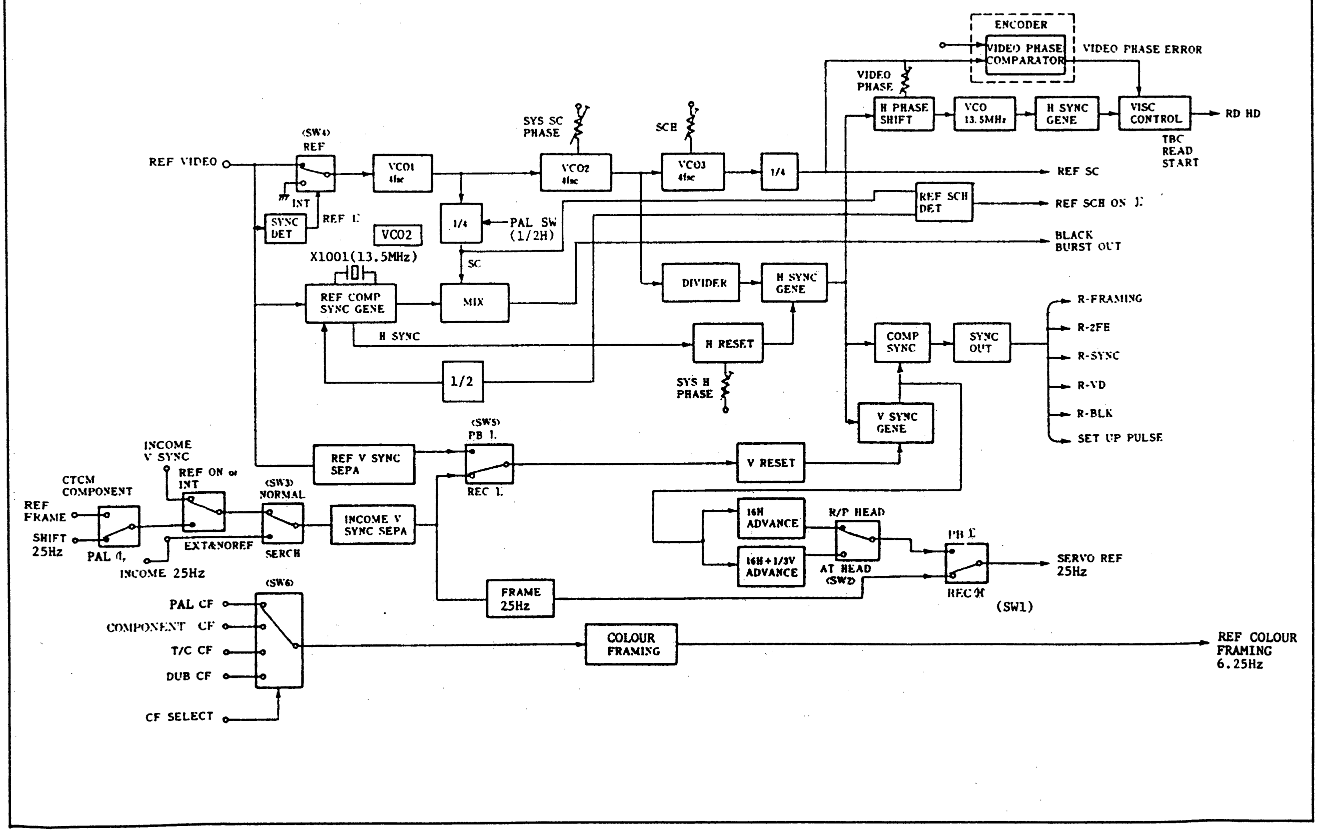


Fig. 9–2 SYNC Generator

(1) Servo Reference Signal (25Hz)

This circuit generates the reference 25Hz signal for servo control. For easy understand a Drum servo is explained.
In the recording mode, Drum phase must be locked with the income video V sync, so the <SW1> is turned to the "Income V sync sepa" side.
In the playback mode, Drum phase must be locked with Reference video V sync when reference video signal is supplied to the unit. So the servo reference 25Hz signal is generated from Reference V sync, but it is necessary to compensate TBC delay.
In the R/P head playback mode, the video signal is delayed 16H by the TBC memory circuit. Therefor to compensate this delay, Drum phase is advanced 16H.
In the AT head playback mode, the video signal is delayed 16H + 1/3V, it is caused by AT head position is physically off set by 60 degrees behind the R/P head, so the Drum phase is advanced 16H + 1/3V.

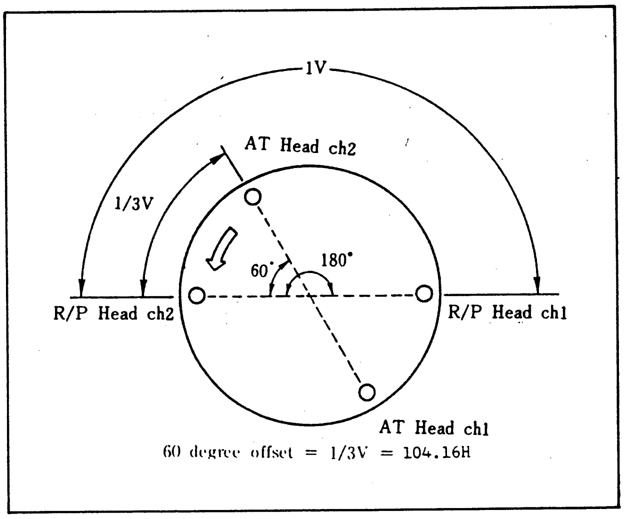


Fig. 9–3 AT Head Position

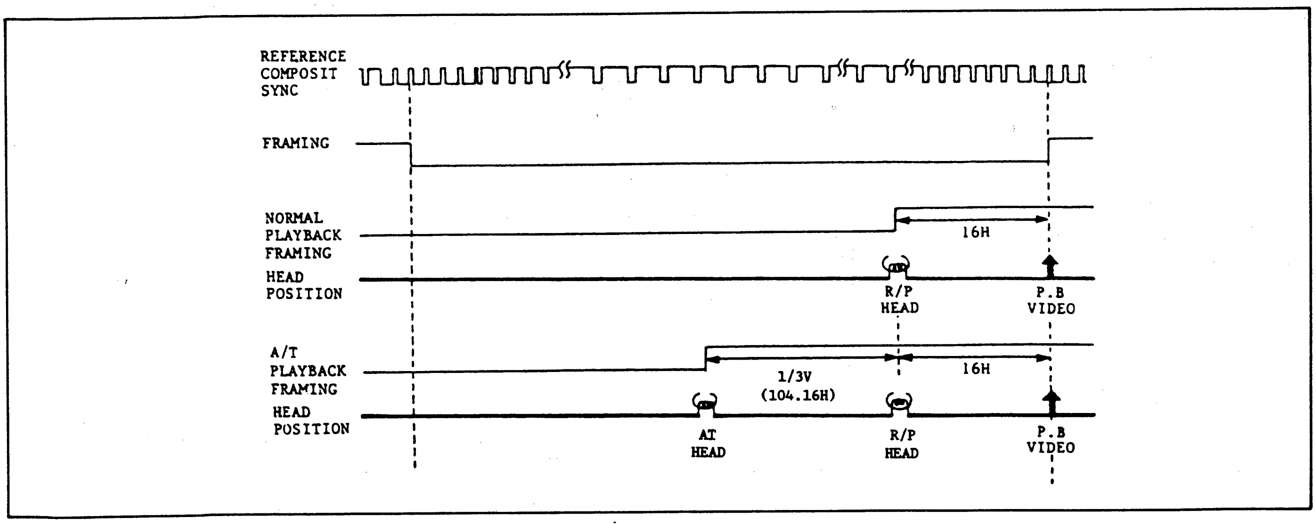


Fig. 9–4 Servo REF Signal Timing

Regarding Capstan servo, capstan phase should be locked with the Drum phase, so the same servo reference 25 Hz is used.

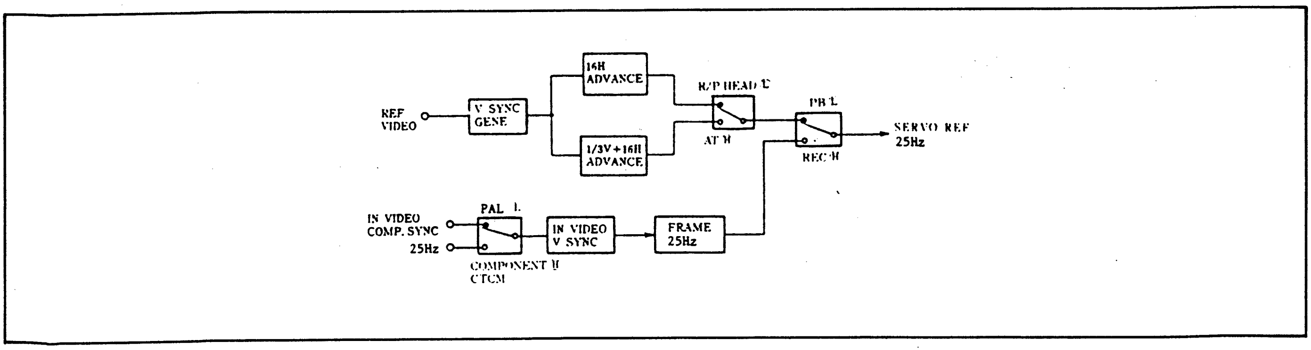


Fig. 9–5 Servo REF Generator

(2) Various synchronization signals and subcarrier generator

This circuit generates the sub–carrier signal component sync signal, and other various sync signals. This sub–carrier is supplied to the balanced modulator to modulate the component signals. The composite signal is mixed with the luminance signal and chrominance signal, then the PAL signal is obtained.
Refer to Fig. 9–2. In this circuit three 4–fsc VCO circuits are used.
When the reference video signal is supplied to this circuit, SW4 is turned to the REF side. VCO1 is locked with the REF video sub–carrier and generates a 4 fsc signal. As it is divided by 4, the sub–carrier is obtained. Composite sync is also locked with the REF video signal and they are mixed and the Black Burst signal is generated. This Black Burst signal represents the REF video sub–carrier phase and composite sync timing.

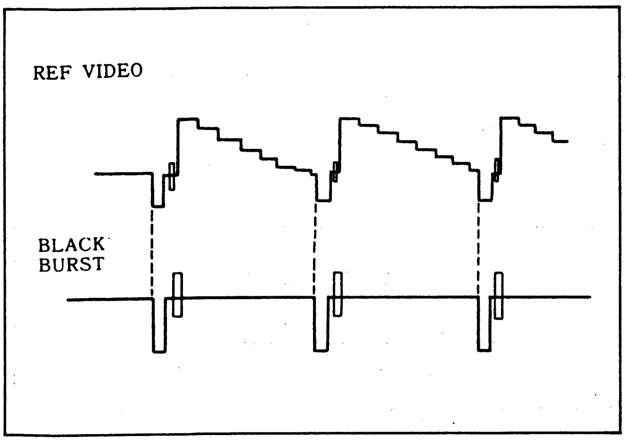


Fig. 9–6 Black Burst Sync

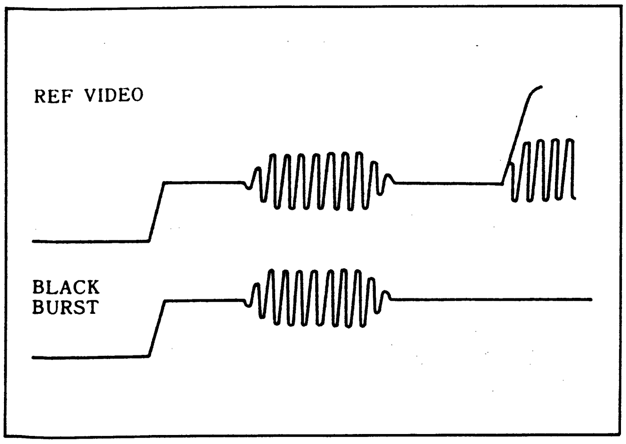


Fig. 9–7 Black Burst Sub–Carrier

VCO2 is used to adjust the System Sub–carrier Phase. User can adjust the sub–carrier phase of video out same as Reference video on the Front Pull Out Drawer. The adjustable range is 360 degrees. The output of VCO2 is supplied to the H Sync Generator, it is necessary to keep the SCH phase.
For example, when the System Sub–carrier phase is adjusted by 180 degrees, the sub–carrier phase of the video out changes 180 degrees and also sync moves according to sub–carrier change as shown in Fig. 9–8.

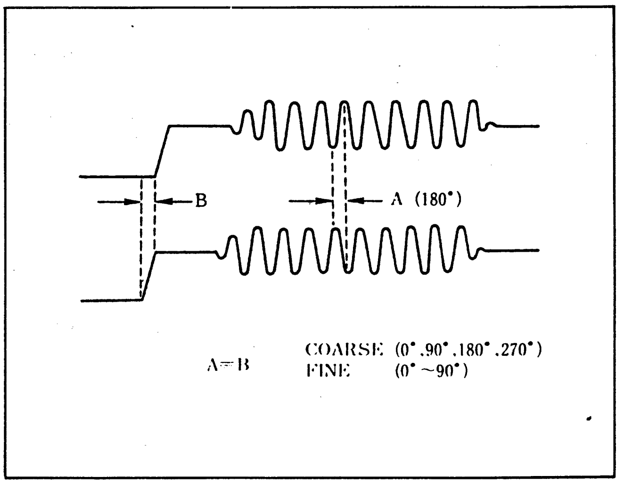


Fig. 9–8 System Sub–carrier Phase

VCO3 is used to adjust the SCH phase.
The SCH Phase can be adjusted by SCH VR on the Front Sub Panel.
SCH is a sub–carrier phase which 0 degrees is defined at the down edge of the H sync as shown in Fig. 9–9. Reference Video SCH is detected on this board and it is indicated on the Front Panel. It shows wheter Ref Video SCH is Standard or not.

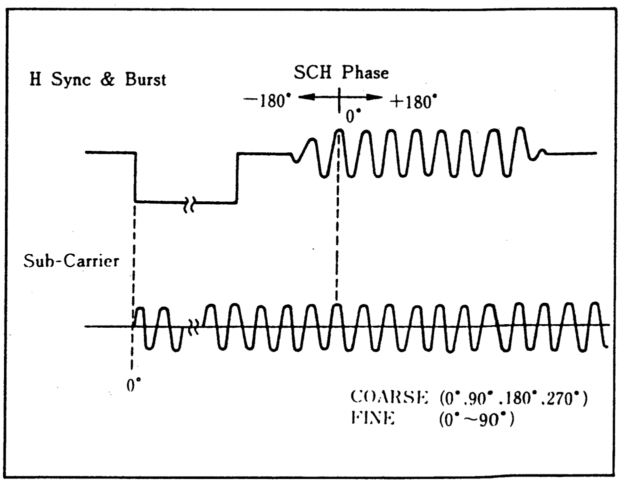


Fig. 9–9 SCH Phase

The System H Phase is adjusted by a System H phase VR on the Front Pull Out Drawer.
Refer to Fig. 9–10. The function of the System H phase VR is similar to that of the system SC phase VR, but the difference is in that the System H Phase VR moves the signal 360 degrees step, while the System Sub–carrier VR moves the signal 0 degrees through 360 degrees.

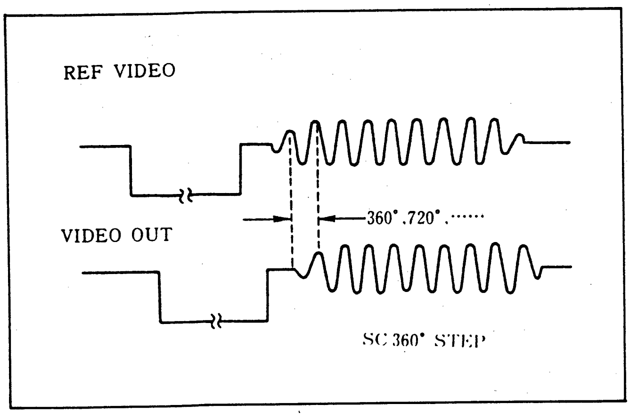


Fig. 9–10 System H Phase

(3) TBC read start signal and clock signal

The TBC uses a 13.5MHz clock, synchronized with H information (which is, in turn, synchronized with input REF VIDEO). To generate read start signals, the clock is divided by 864. These start signals (RD–HD) can be controlled with the VIDEO PHASE in the front pull–out drawer. At the same time, in order to perform VISC control, the phase of the VISC signal, inserted in the 15th line (by the decoder circuit) is detected, and the read start position is controlled, to ensure that sub carrier phase is the same as the VISC signal.
It is necessary to remove carrier leakage after encoding.

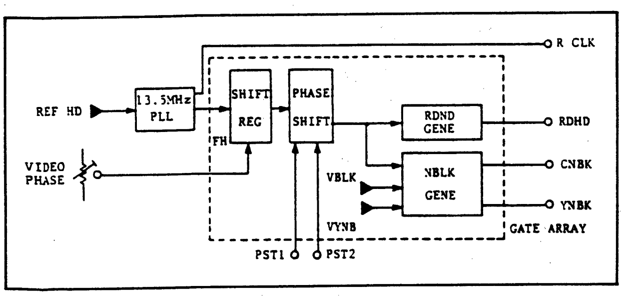


Fig. 9–11 Read REF Signal Generator

(4) Colour Framing 6.25Hz

There are 5 kinds of colour framing signals,which are used for Reference colour framing. These colour framing signals are selected by CF SELECT1, CF SELECT2 and CF SELECT 3 from the System Control circuit.

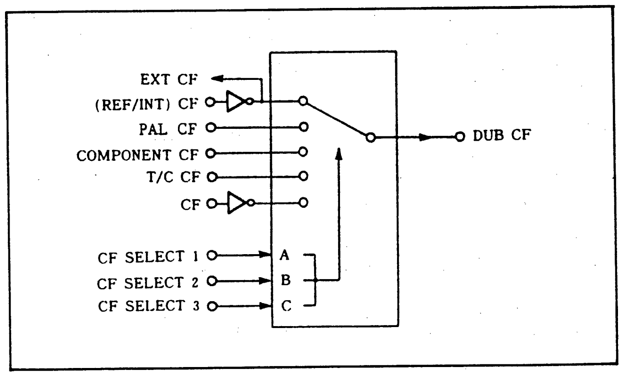


Fig. 9–12 Colour Framing Signal

REF CF is used for Normal playback or EXT Sync Recording.
INT CF is used for Normal playback without Ref In.
Component CF is used in the component recording mode. When recording and playback is performed by using the component signal, colour frame control is not necessary. However, when the PAL signal is input, and decoded to be made into the component signal, VISC control is conducted, so Component CF is necessary.

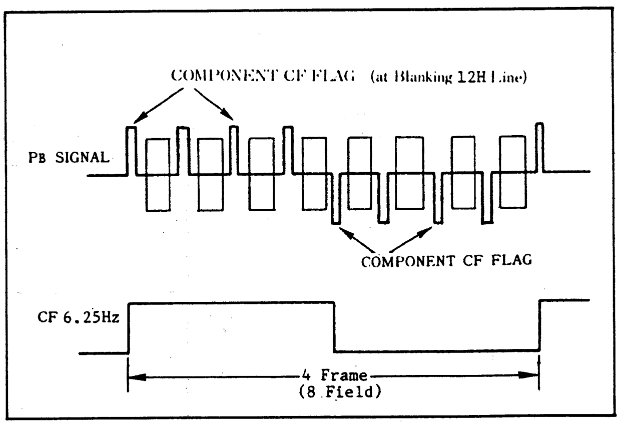


Fig. 9–13 Component CF Flag

Time code CF is used in the component video recording mode. If this component video has Component CF Flags, the CF Flags are used.
If the component video does not have Component CF Flag, Time code CF is used.

Time code CF information is recorded at 11th bit of Time Code Data.

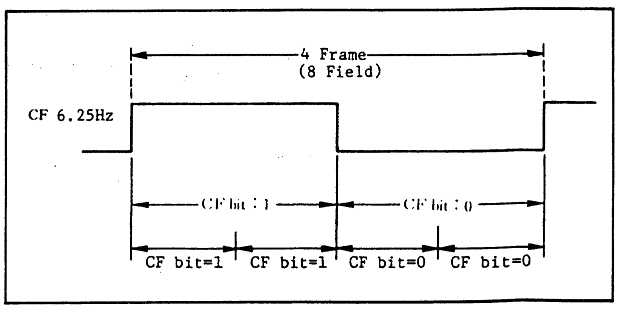


Fig. 9–14 Time Code CF

Dub CF is used in the Dub recording mode. For this purpose a Dub CF Flag is added on the CTCM signal at the blanking 15H Line same as the component CF Flag.

9–1–2. Detailed Description of Sync Generator

As explained above, this circuit has the following 4 functions : generating.

(1) Servo reference signals
(2) Various synchronization signals and sub–carrier
(3) TBC read start signal and read clock
(4) Colour framing reference 6.25Hz

(1) Servo reference signal

Figure 9–15 shows the servo reference circuit. Playback servo reference is created from the REF VIDEO signal. Record servo reference is created from the input video signal. Switching between the two is done via an ADV (L) 2 (M41A) signal sent from the system control computer High ADV (L) 2. Selects the input video signal, and low, ADV (L) 2 selects REF VIDEO.

During recording and confidence playback, the servo reference is created from the input video. COMPOSITE SYNC (M35A) is sent from the CTCM circuit. The comp sync input passes through the V Sync Sep circuit, and creates V sync. V sync is compared to H–sync to develope framing synchronization. This is input with the video signal to the gate array, generating the 25Hz servo reference signal (first and third fields are high) which is timed to the rising edge of the second serration as shown in figure 9–16. This occurs during the 1st & 3rd fields. The 25Hz framing signal is passed through a LPF with a time constant of 0.2 sec. This is compared with the 25Hz signal of the internal free–run 25Hz. If lack of framing persists for more than 0.2 seconds the 25Hz signal is inverted, since the LPF output will not change within the time determined by the time constant of the low pass filter, even if the framing detection circuit malfunctions due to noise, a stable servo reference signal can be obtained during that interval.

When "non–standard" mode is selected, the framing requirement is dropped and the servo reference pulse is locked to any field. In the standard mode, noise pulses could upset the framing circuit.
Therefore a LPF with 0.2 sec delay is used in the reset path to prevent changes in framing caused by these disturbances.

The servo reference signal is taken from the source machine when the "dub" input is utilized.

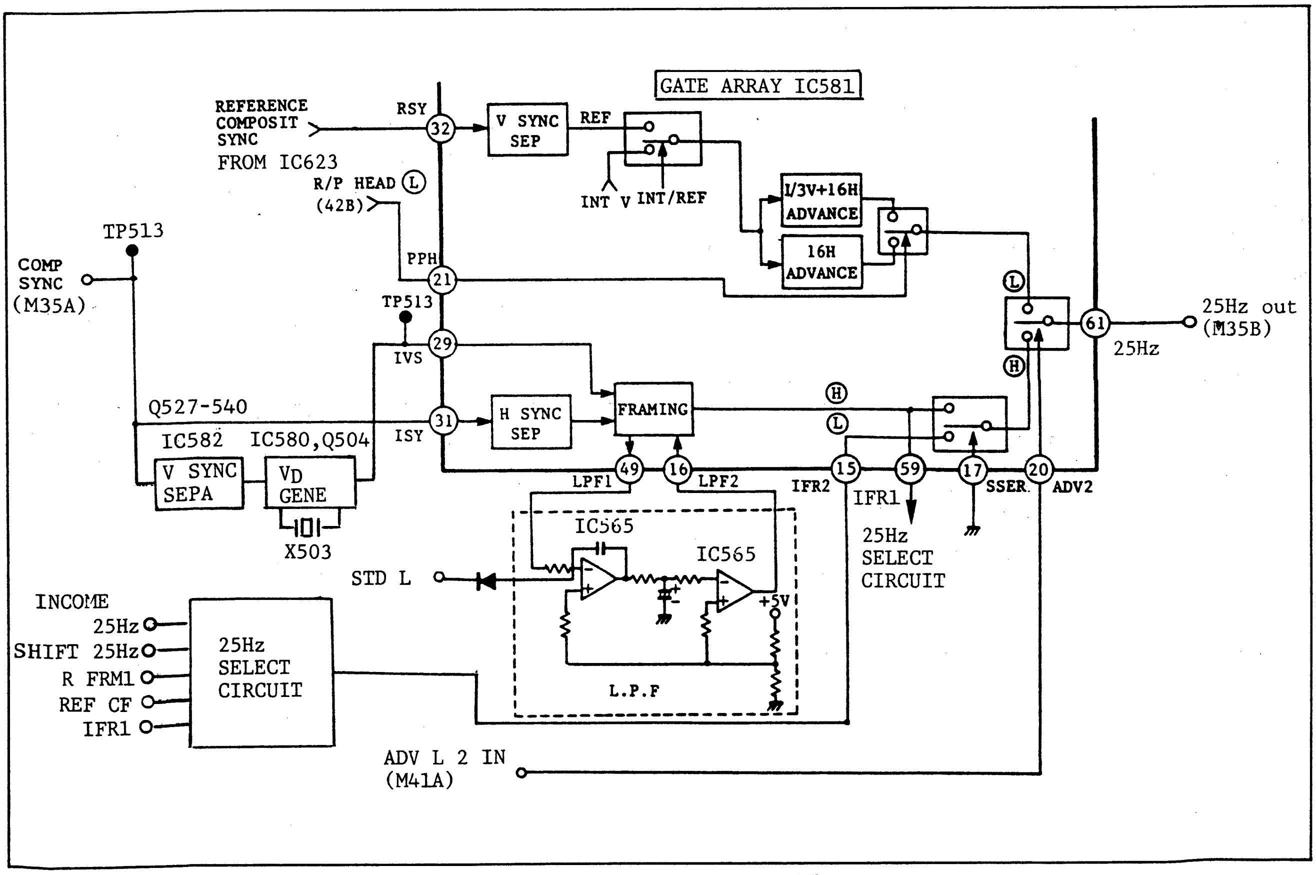


Fig. 9–15 25Hz Servo REF

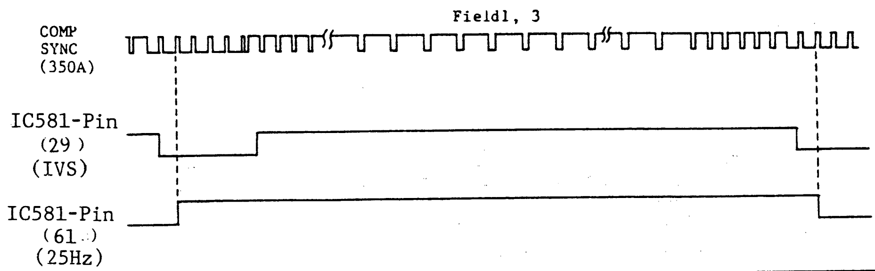


Fig. 9–16 Servo 25Hz Generator

During normal playback, and playback using the AT head, servo reference is take up from reference video. Since these pass through the TBC circuit, all must be advanced by 16H. During AT playback these must be advance an additional 1/3V (1/3V + 16H = 120.2H). For this reason, the amount of advance is determined by the gate array, whose state is controlled by the R/P HEAD (L) signal. This signal is sent from the system control computer depending on the front panel switches and operating mode (AT mode).

(2) Generation of sync and sub–carrier signals

This circuit generates various synchronizing signals and sub–carrier necessary for modulation by the encoder circuit, to produce an PAL signal from the component signals.

During playback, all output signals are synchronized to REF VIDEO signals. V sync, H sync and the sub–carrier are generated from the REF VIDEO signal.

Fig. 9–17 shows the reference video sync separation circuit. The reference video signal is supplied to this sync separation circuit and the reference sync is supplied to pin 32 of the gate array IC523. Then composite sync is generated from pin 69 of IC523. This composite sync is used for Black Burst signal generation, so the composite sync of the Black Burst signal is synchronized with the reference video signal. This composite sync signal (CS1) is also used for the reference sync of another gate array IC581.

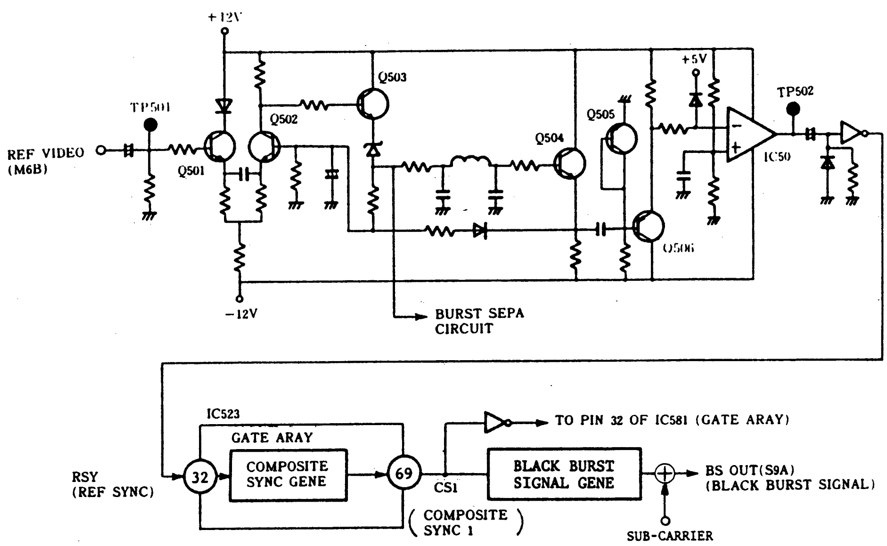


Fig. 9–17 Reference Video Sync Separation

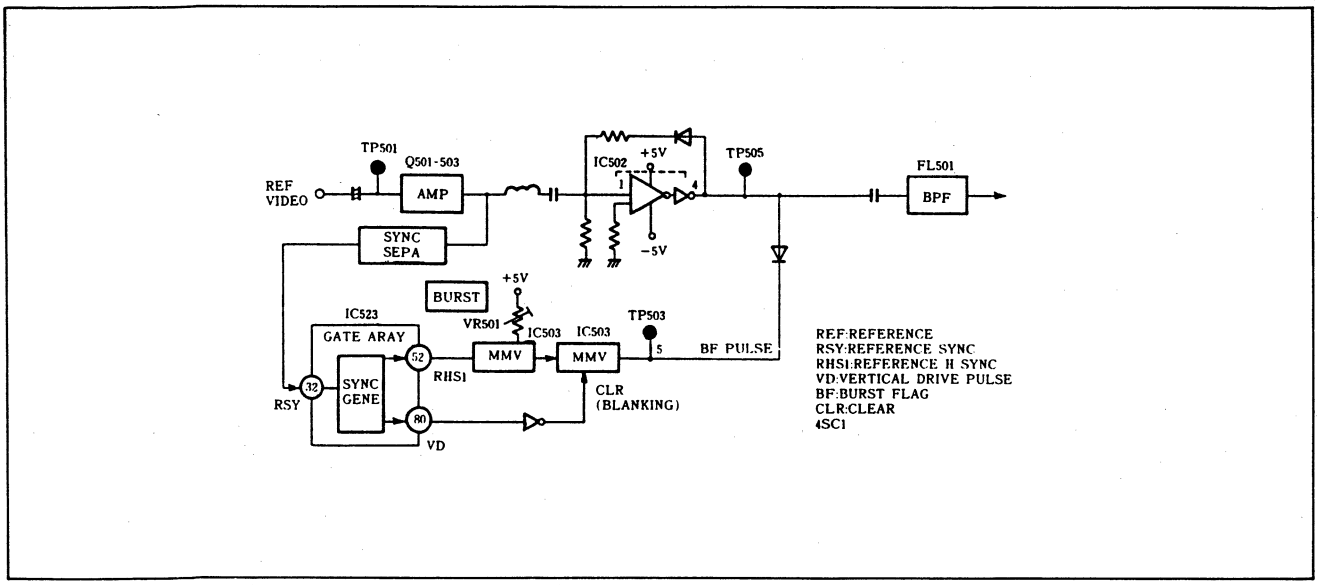


Fig. 9–18 Reference Video Burst Separation

Fig. 9–18 shows the reference video burst separation circuit. The reference video signal is amplified by Q501, Q502 and Q503, and supplied to IC502.
The burst signal is selected by the Burst Flag signal and only the burst signal is supplied to BPF, FL501. A Burst Flag pulse is made from the Reference sync signal. The Reference sync signal (RSY) is supplied to pin 32 of the gate array IC523, then the Reference H Sync (RHS1) and Vertical Drive (VD) signal is generated. The RHS1 signal is supplied to pin 1 of IC503 (MMV) and a Burst Flag pulse is generated. During blanking period, the burst signal does not exist so the VD signal is used for this blanking.

Fig. 9–19 shows the Burst Phase Comparator. Signals going to the burst separator pass through a 3.58MHz band pass filter (FL501). The burst signal is supplied to one input of the balanced modulator IC507–1. The SC0 signal is supplied to pin 3 of IC507, Balanced modulator.

The phase of SC1, IC523–78, is same as the reference video burst signal and the phase of SC0 is 90 degrees advanced than SC1.
The output of the balanced modulator is zero when SC0 and SC1 differ in phase of 90 degrees. If the phase difference is smaller than 90 degrees, the high signal appears on pin 7 of IC507 and the oposite case is also true. This phase error signal is amplified by Q513 and Q514 then the signal is supplied to DC AMP through switches IC508. The Y switch is used to select the burst error signal only, and the Z switch is used when the Reference video signal exists. The output of the DC AMP IC509 is supplied to VC0 (4fsc) and the output 17.7MHz signal (4.43MHz x 4) is fed back to the Balanced Modulator IC507 through the GATE ARRAY IC523. Therefore the SC1 which is used for the Black Burst sub–carrier is phase locked with Reference video burst phase.

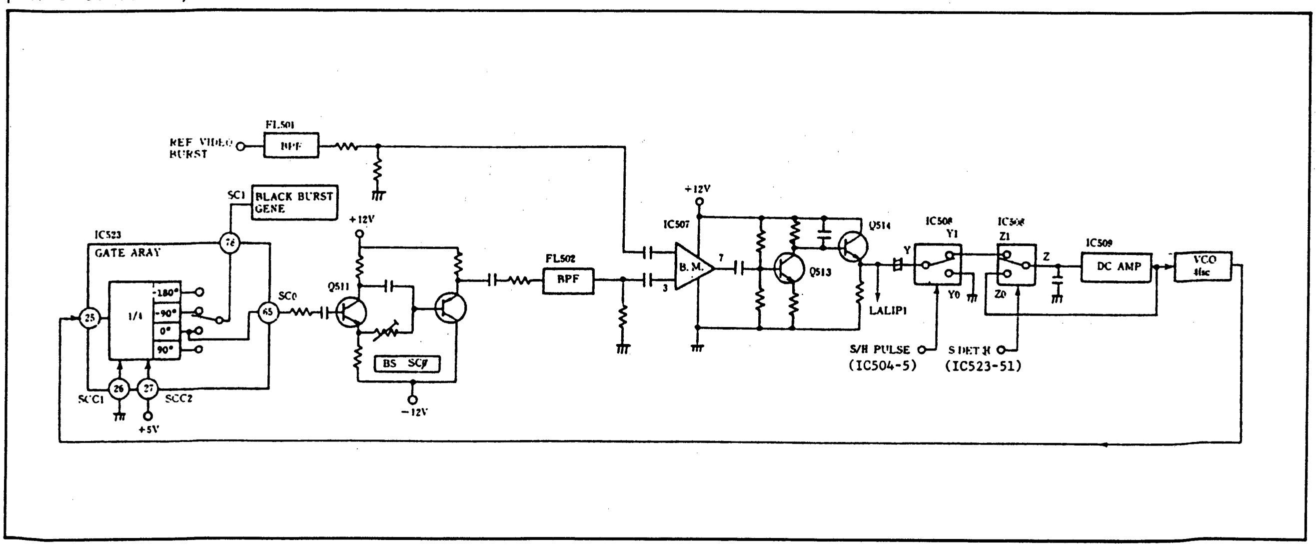


Fig. 9–19 Burst Phase Comparator

Fig. 9–20 shows the phase relationship between SC0 and SC1.

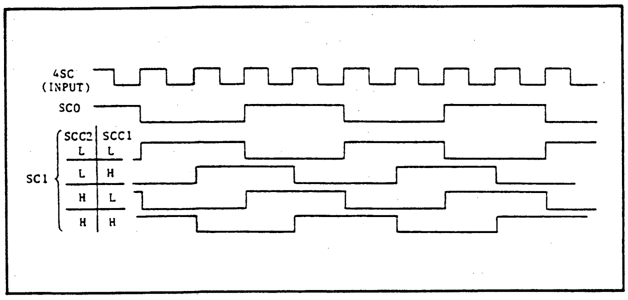


Fig. 9–20 Sub–carrier Timing

The output error voltage is sent to the 17.7MHz VCO circuit. This error voltage at TP506 passes through the analogue switch of IC508 and is sampled with the Sampling Hold pulse. Capacitor C51 is the Sampling Hold capacitor. The sampled error voltage is buffer by IC509 and filtered by IC509. The phase of the 17.7MHz is adjusted by the error voltage applied to varactor diode D512. When REF VIDEO is input the S detect (H) is sensed by the gate array. The 17.7MHz VCO is then locked to the burst of the REF VIDEO. When REF VIDEO is not input, S DET goes low, and the 17.7MHz VCO enters the free–run state, and the mode is switched to internal.

The 17.7MHz clock signal is input to the SC GEN in the gate array IC523–25. Creating a sub–carrier signal synchronized with the REF VIDEO. The burst flag pulse and Sampling Hold pulse used here are created using the sync signal separated from the REF VIDEO signal.

BF Pulse is produced by 2MMV's, the 1st one sets the delay from REF Sync while the second one sets the width of the pulse to 3.5 usec.
The sampling hold pulse is produced similary with the sample time occuring in the center burst and a sample time of 1 usec.

The circuit is shown in figure 9–22, while figure 9–23 shows the circuit's timing relationship.

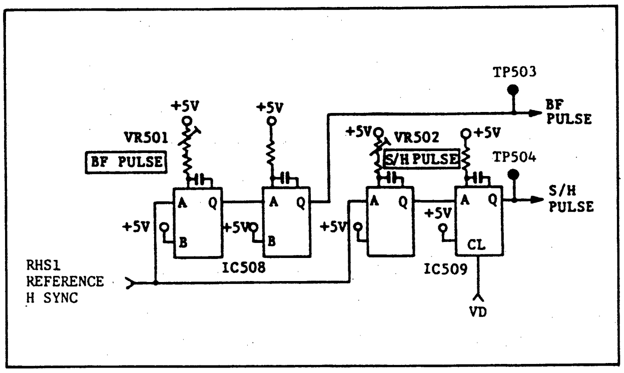


Fig. 9–22 S/H PULSE

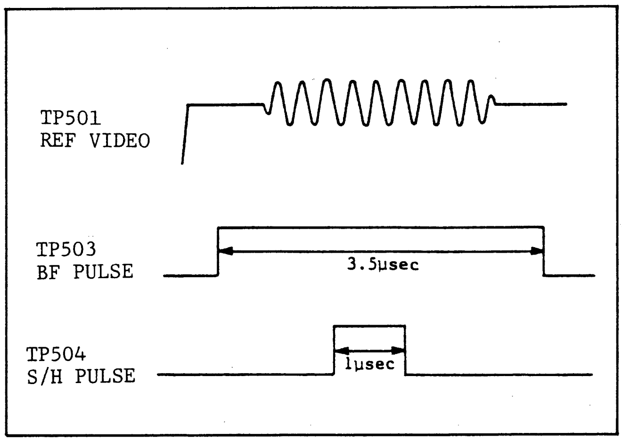


Fig. 9–23 Burst Flag & S/H PULSE

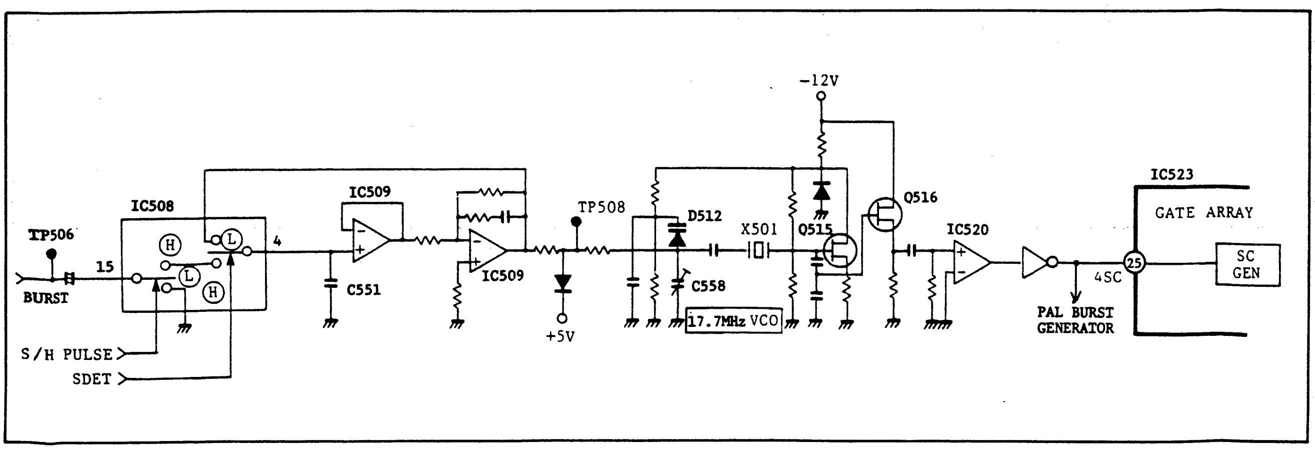


Fig. 9–21 17.7MHz VCO

Fig. 9–24 shows the black burst signal generator. The Advanced Burst Flag (ADBF) is supplied to the MMV IC517 from IC523–66. Then the ADBF signal is adjusted by VR508 (Burst Flag Phase) and VR509 (Burst Flag Width), so the suitable Burst Flag signal is obtained. The generated Burst Flag is supplied to one input of the Balanced Modulator IC518. Another input of IC518 is PAL Burst signal, so the Burst Flag is modulated and Burst signal is generated.
On the other hard, the composite signal (CS1) is supplied to the Buffer Q534 from IC523–69. The sync level is adjusted by VR514 (SYNC G). The composite sync is mixed with the sub–carrier at TP512 and the Black Burst signal is obtained.
The Black Burst signal's sub–carrier phase and composite sync is synchronized with the reference video. Fig. 9–25 shows the Reference SCH detector. This circuit detects whether the SCH of the reference video is standard or not. If the reference video SCH is standard, the Low signal is generated and the REF SCH LED on the Front Panel lights up.
SCH is detected by comparing th H sync phase and sub–carrier phase.

The sub–carrier (REF SCH SC) is supplied to pin 2 of IC513 and the H sync pulse (REF FH) is supplied to pin 4 of IC513 through JK–FF and MMV. The REF FH phase is adjusted by VR505 (SCH DET). The phase difference pulse is supplied to the differential amp Q565 from pin 7 of IC513, and the phase error signal is charged by C570 and observed at TP531. This phase error DC voltage is sampled by IC511, Q519 and Q520, and fed to 2 comparators IC592 and IC593 through IC515. IC592 decides the lower limiter level of phase error DC and IC593 decides the upper limiter level of phase error DC. These levels are adjusted respectively by VR506 (SCH–L) and VR507 (SCH–H). Finally the output of the 2 comparators is supplied to the inverter Q523 and when DC error voltage is in the specification, the low signal is obtained.

During recording and confidence playback, only H sync and the sub–carrier are synchronized with the REF VIDEO input. The float V mode is used for V sync, and is synchronized with the COMP SYNC signal input from the CTCM circuit.
The position of H sync in relation to the sub–carrier can be shifted in 4.43MHz units using the SYSTEM H PHASE VR in the front pull out drawer.

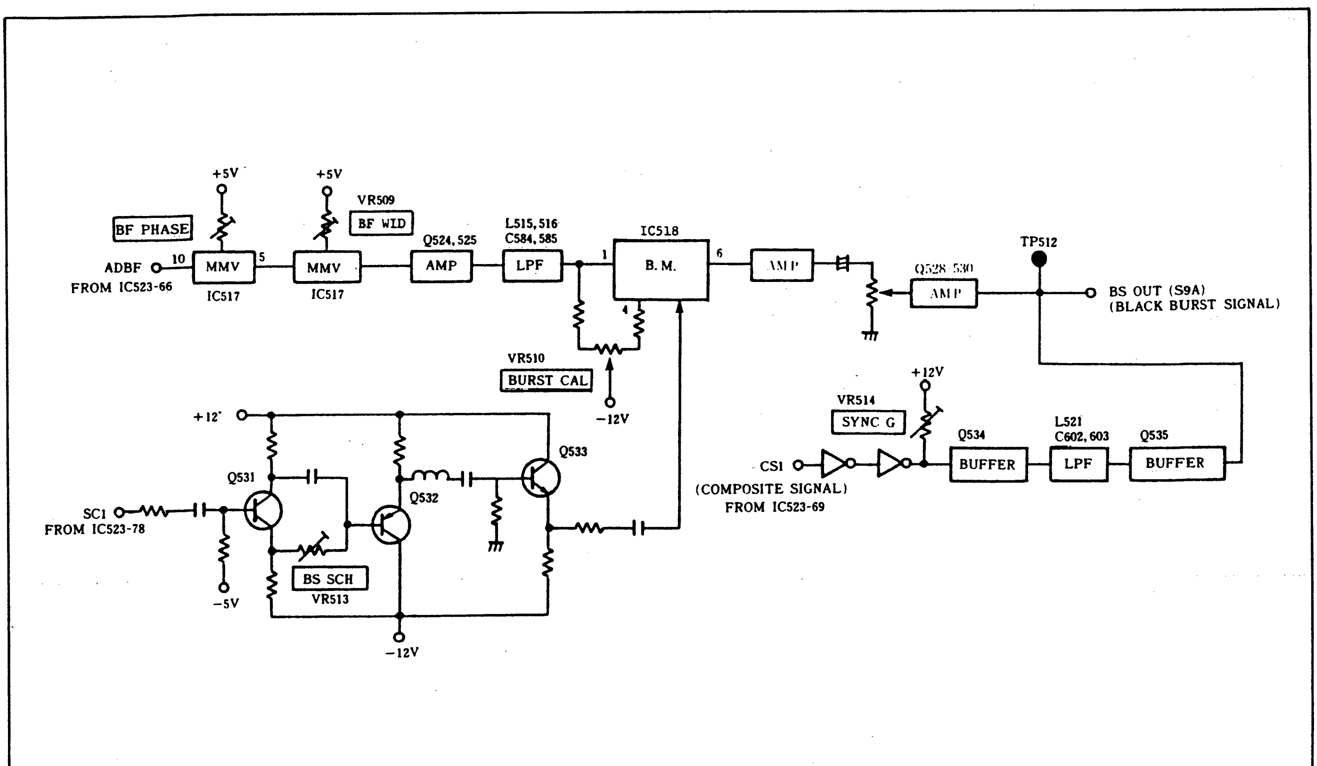


Fig. 9–24 Black Burst Signal Generator

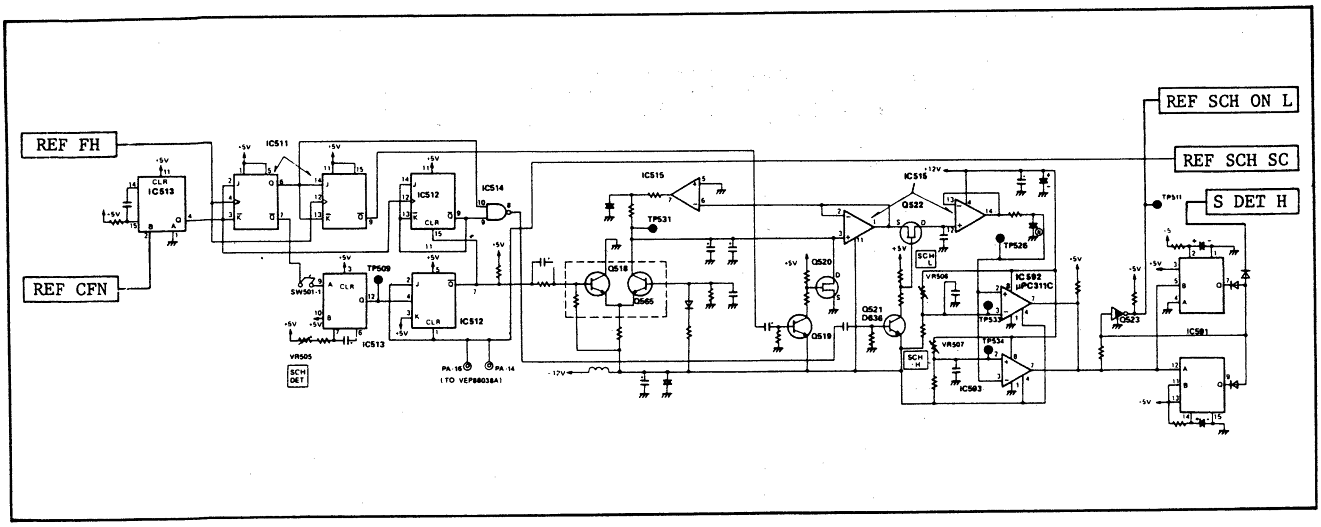


Fig. 9–25 Reference SCH Detector

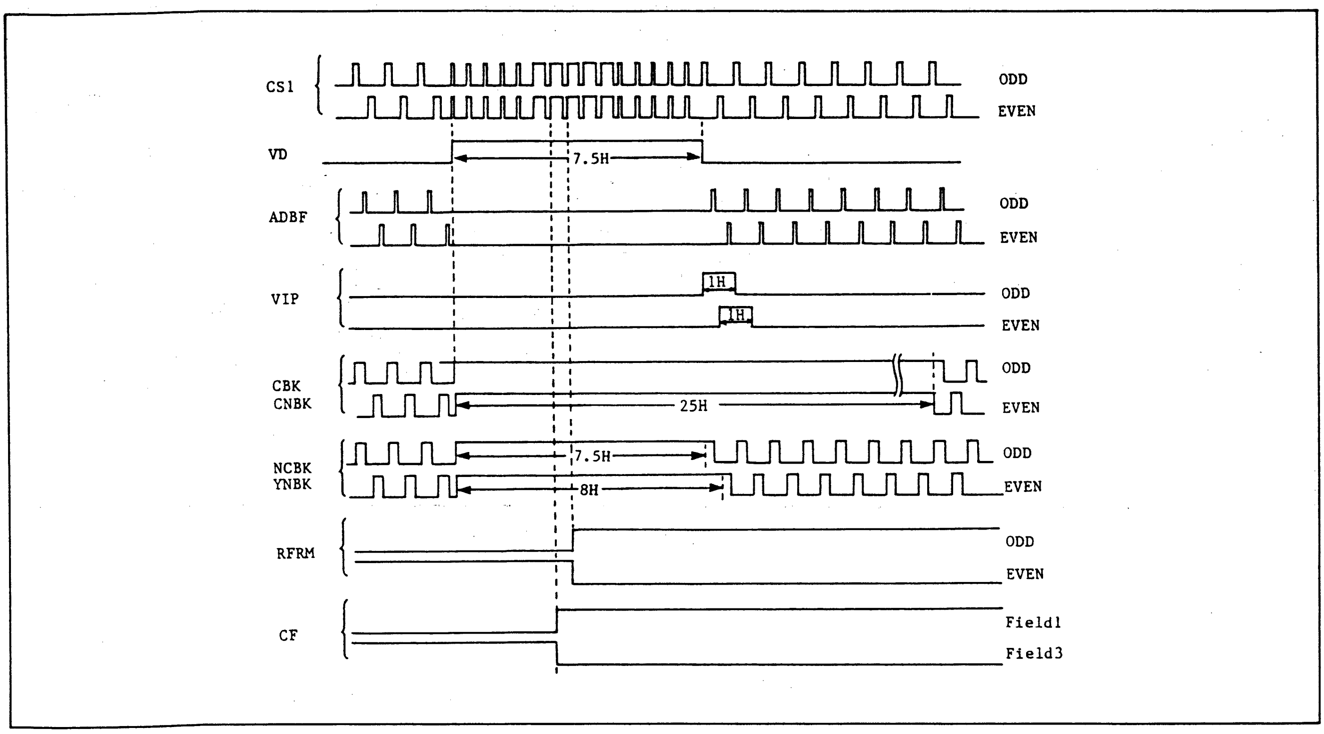


Fig. 9–26 Reference SCH Timing signals

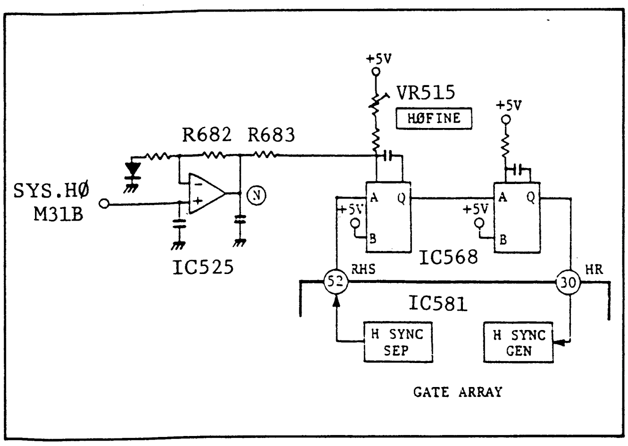


Fig. 9–27 System H Phase

Fig. 9–27 shows a simplified diagram of how horizontal system phase is adjusted. Separated horizontal sync, from pin 52 of the gate array, is delayed by two monostable multivibrators before being returned to pin 30 as horizontal timing information.
A DC control voltage, from the front pull out drawer, is buffered by an OP amp and then used to control the time constant of the first MMV. The second MMV is triggered from the trailing edge of the first monostable pulse. The pulse at TP518 is the horizontal timing reference for the sync generator.

The SCH control circuit maintains proper SCH phase when the external REF VIDEO signal does not conform with the specification of RS–170A.

The phase of the 4.43MHz sub–carrier signal (pin 78 of IC581) created in the gate array, and can be externally controlled with the phase shifter circuit consisting of transistors Q555–Q558 and varactor diodes D531 and D532. Phase can be varied over 90 degrees using the SCH adjustment control in the pull out drawer.
This signal is in the sent to the balanced modulator (IC531) and its phase is compared with that of the fed back 3.58MHz clock. Error voltage becomes 0 when the phase difference is 90 degrees. This error voltage passes through a buffer and filter amp IC532, and is input to the crystal oscillator circuit of X504.
The oscillation frequency is 17.7MHz. The sub–carrier phase is variable in 90 degrees increments (70 nsec). A signal is sent from the 2–bit encoder switch labeled SCH COARSE (1), (2) in the pull out drawer. In this way, an SCH controlled reference sub–carrier signal (M28B) is sent to the encoder.

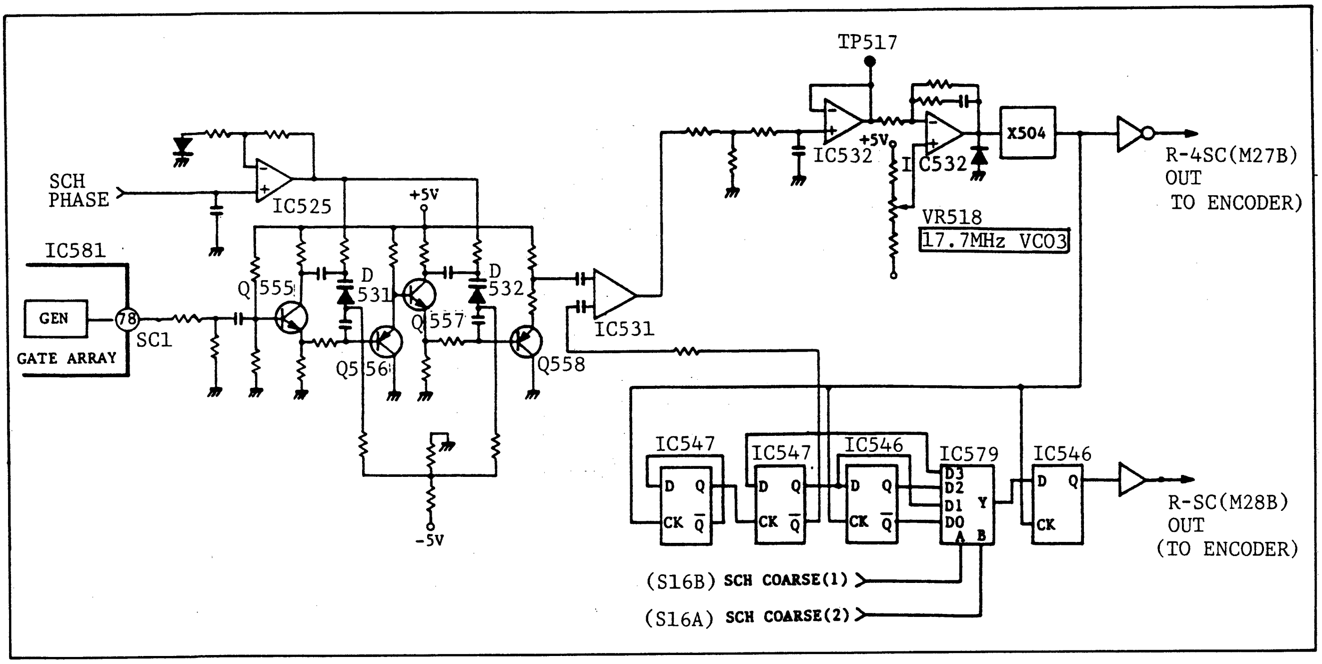


Fig. 9-28 Sub-carrier Phase Control

(3) Generation of TBC read start signal and clock

This circuit is needed to clock out the video signal data stored in the TBC circuit, using a clock synchronized with the external REF VIDEO signal or internal synchronization signal. A/D conversion is performed in the ENCODER circuit with a 13.5MHz clock signal. (Reading also requires a 13.5MHz signal). This frequency conforms to the proposed "4:2:2 Component symbolization" international standard.

This circuit performs read out of the video signal, so that the PAL signal inserted in the 15th line is phase locked to the subcarrier used for encoding the PAL signal. Control is performed to cancel the carrier leak that can occur in the decoder. The phase of read start signal (RD-HD) generated inside the gate array is controlled in 13.5MHz clock units (74 nsec) by a 2-bit phase control signal (V01, V02), sent from the encoder. The 4.43MHz phase difference cannot be completely set to 0 with this clock. Therefore the 13.5MHz phase must be controlled so that the difference becomes 0 in the analogue signal (VISC CONT).

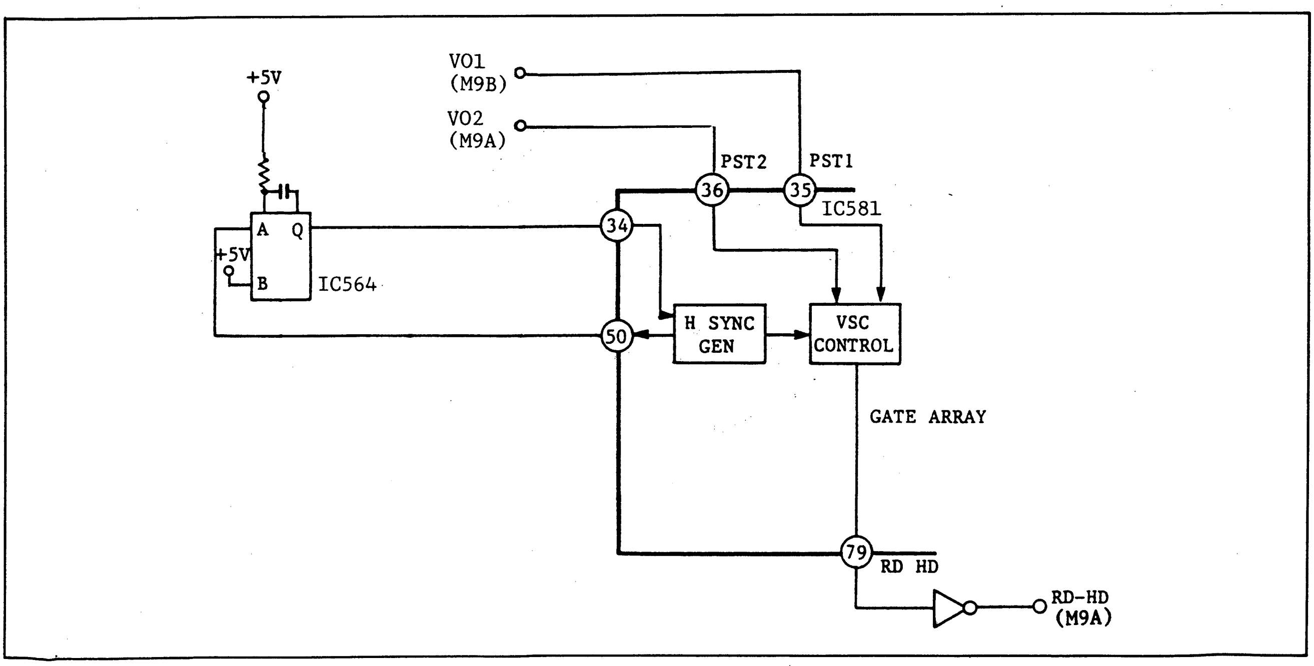


Fig. 9-29 Video Phase Control

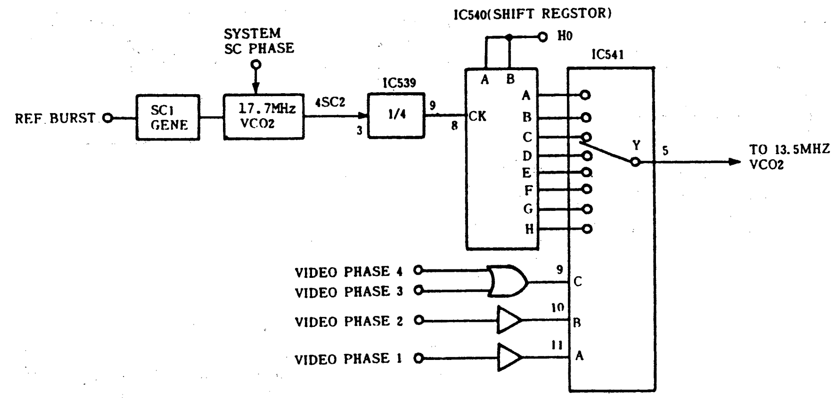


Fig. 9–30 Video Phase Control

Additional control of video phase input from the pull–out drawer.
Refer to Fig. 9–30. The 4SC2 signal is phase locked with the video out sub–carrier phase and the H0 signal is phase–locked with video out H sync.
The 4SC2 signal is divided by 4 by IC539 and supplied to pin 8 of IC540, shift registor, as a clock. The HO signal is supplied to IC540–1 and 2 as a data signal. IC540 is a 8 step shift registor so the H sync phase is able to shift the H sync by 8 step each sub–carrier 360 degrees.
It is necessary to keep the SCH phase and system sub–carrier phase.
These 8 step H sync are selected by an analogue switch IC541. IC541 has 8 inputs, 1 output and 3 select input.

Fig. 9–31 shows the VISC Control Simplified Block. The VISC phase and REF Video sub–carrier phase are compared by the phase comparator and phase error is generated on the Encoder board. The phase error (VISC CONTROL) signal is supplied to the phase shift clock generator on the Sync Gene circuit, and TBC Read Start pulses (RD–HD) are generated and supplied to the TBC circuit. On the TBC circuit video phase is shifted depending on this phase error signal (VISC CONT), so that the VISC phase and REF VIDEO SC phase are equal. It is necessary to cancel sub–carrier leakage. Fig. 9–32 shows the VISC control circuit on the sync gene board. This circuit is used to generate the TBC read clock 13.5MHz, and the VISC CONTROL signal changes the 13.5MHz phase.

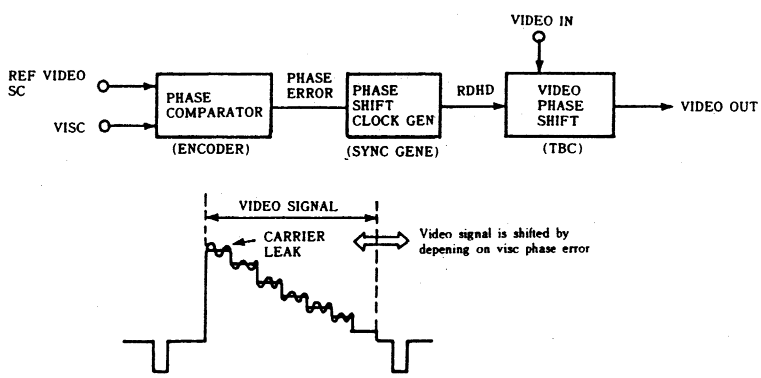
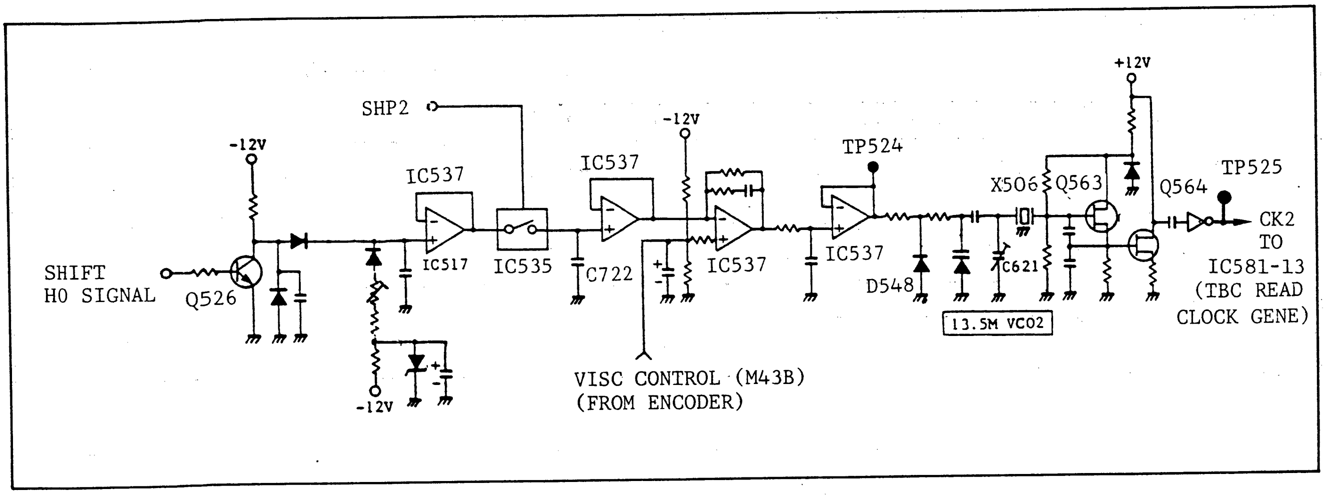


Fig. 9–31 VISC Control circuit



(4) Colour Framing Signal

Colour Framing 6.25Hz is produced by the sub-carrier PAL P (PAL Pulse), and Frame Pulse.
Refer to Fig. 9–33.
The first line of the first frame is 1H (Odd line), and second line of the first frame is 2H (Even line). In the PAL system, the sub-carrier phase is shifted 90 degrees for each line. The phase of the sub-carrier can be known from the remain of dividing a line by 4. For example, if 5H is devided by 4, the remain is 1, so the sub-carrier phase is 0 degrees. When the line number is odd, PALP becomes high, and when the line number is even, PALP becomes low. For example, 1H is odd line, so the PALP is high and 626H is even line, so the PALP is low.

The Frame pulse is a 25Hz pulse and it rises at the beginning of the frame. The 1/2 Frame pulse is produced from a Frame pulse and PALP. AT the rising edge of the frame pulse, if PALP is high, the 1/2 frame pulse becomes high and if PALP is low, the 1/2 frame pulse becomes low.
The rising edge of the 1/2 frame pulse check the sub-carrier phase. If the Sub-carrier is 0 degrees CF Pulse becomes High and If the sub-carrier phase is 180 degrees, the CF Pulse becomes low, so the CF 6.25Hz signal is generated.
Fig. 9–34 shows the actual CF Pulse generator and Fig. 9–35 shows the CF Pulse Timing of the CF Pulse generator.

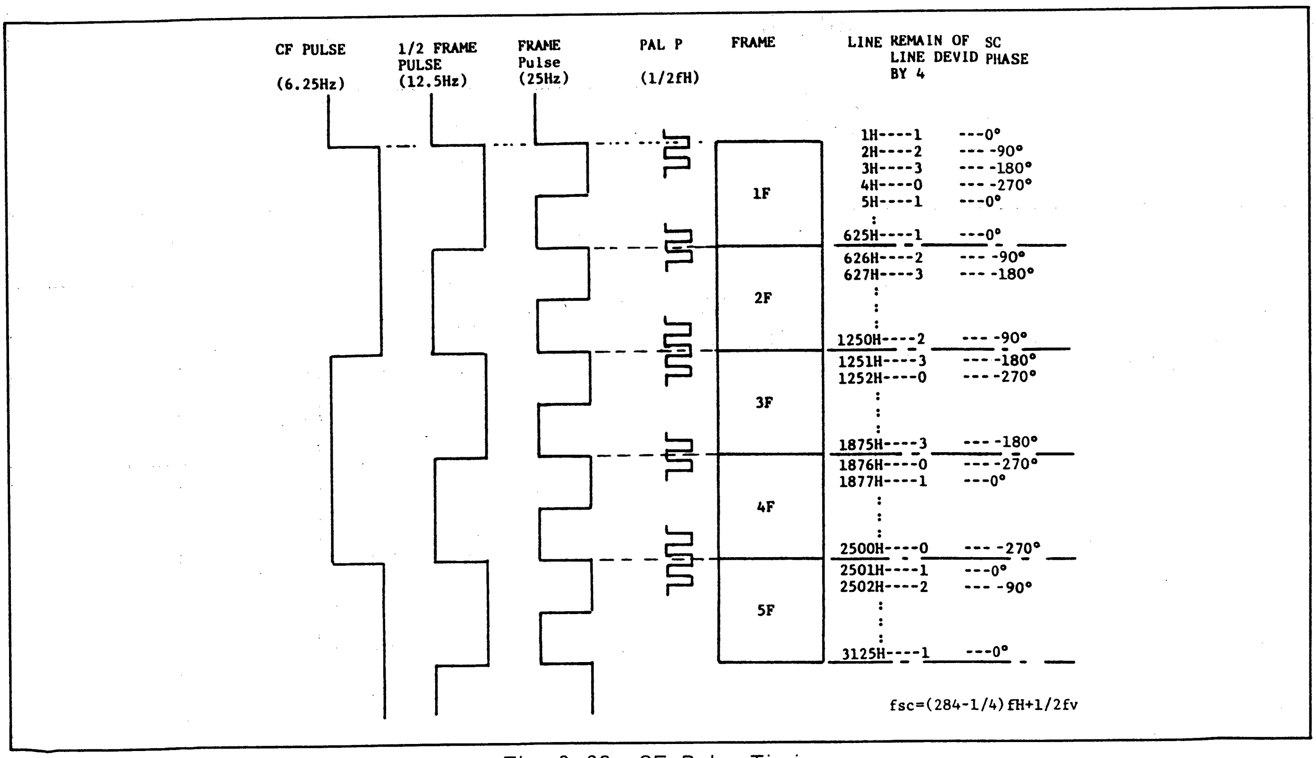


Fig. 9–33 CF Pulse Timing

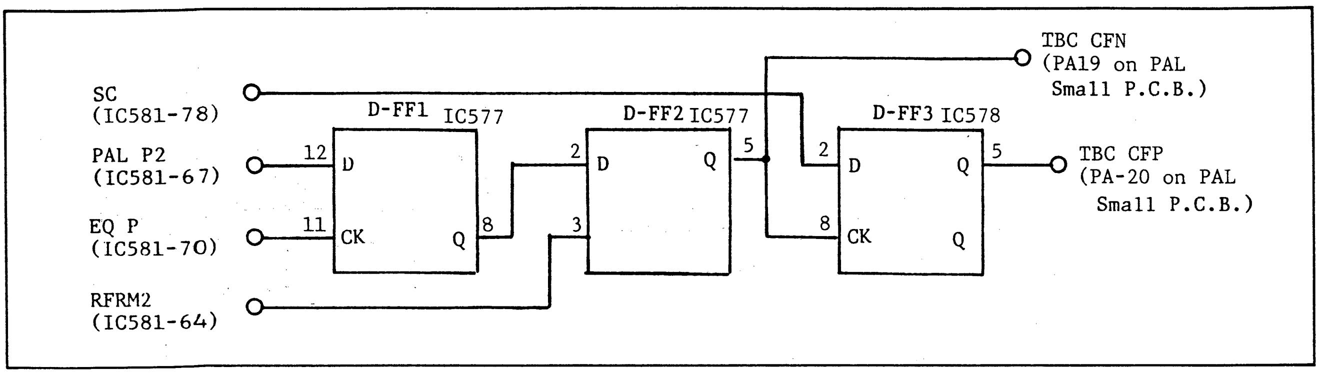


Fig. 9–34 CF Pulse Generator

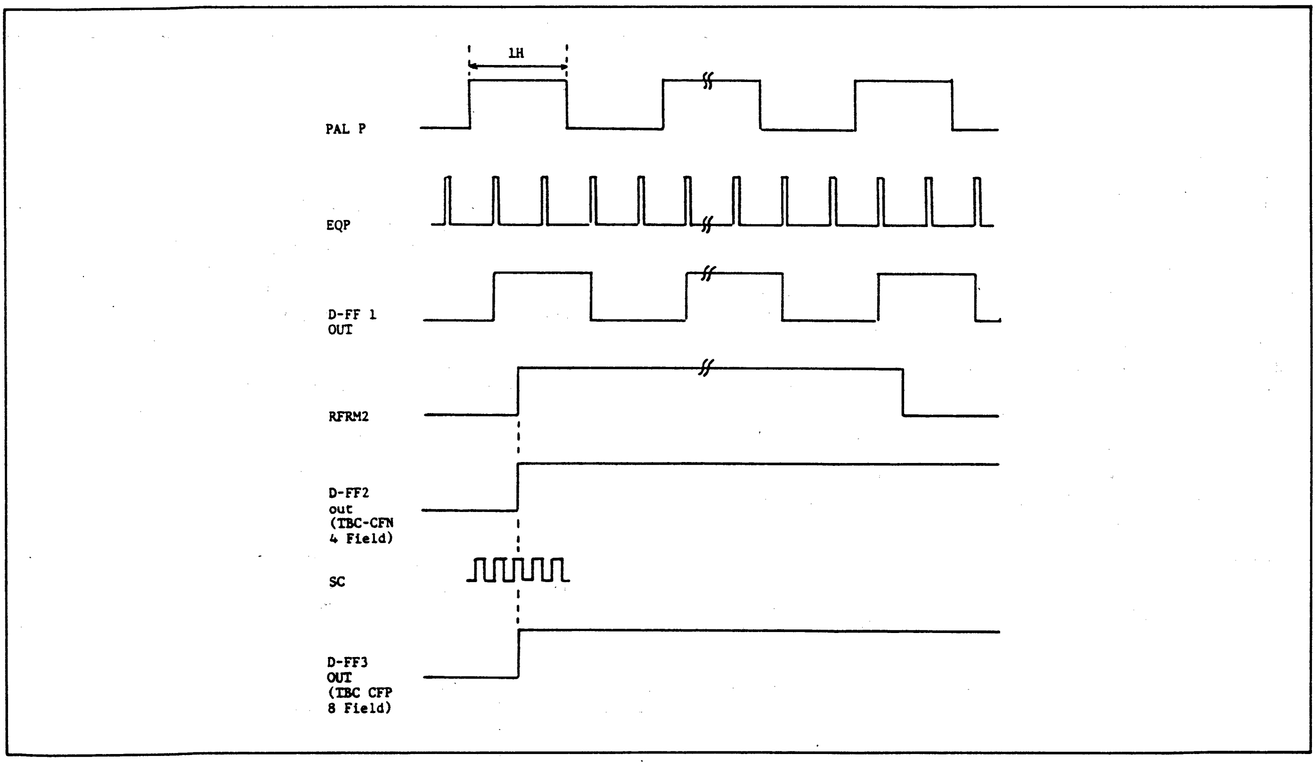


Fig. 9–35 CF Pulse Timing

Fig. 9–36 shows the colour framing 6.25Hz Generator. Colour Framing 6.25Hz signal is generated by using Framing pulse and LALIN pulse and it is generated in IC581, gate aray and it is supplied from pin 46 of IC581.

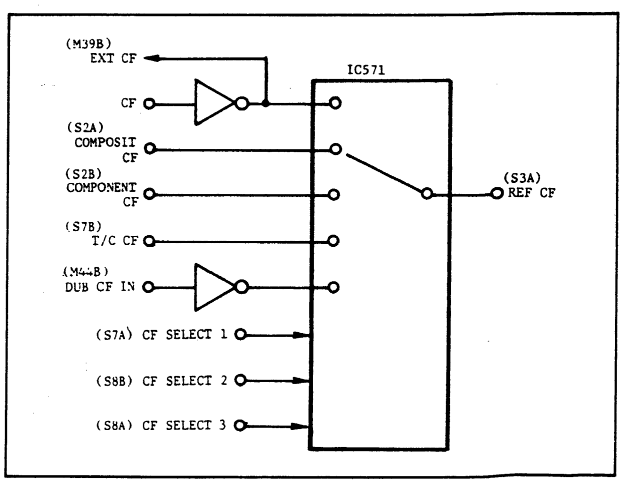


Fig. 9–36 Colour Framing 6.25Hz Generator

TBC-1 (MEMORY SECTION)

9-2. GENERAL DESCRIPTION

This circuit is part of the TBC circuit and performs the following actions using a clock synchronized with the playback signals created by TBC-2 and a clock sychronized with the reference signal.

1. Y/C signal time base correction.
2. Y/C signal drop-out compensation.
3. C signal time expansion.

The above actions are performed on 8-bit signals digitized with the A/D converter of the encoder circuit.

Figure 9-37 shows an overall block diagram of TBC 1, 2 and the encoder circuit. The RF signal played back from the tape is converted to a video signal by the demodulation circuit and then to a digital signal by the A/D converter.

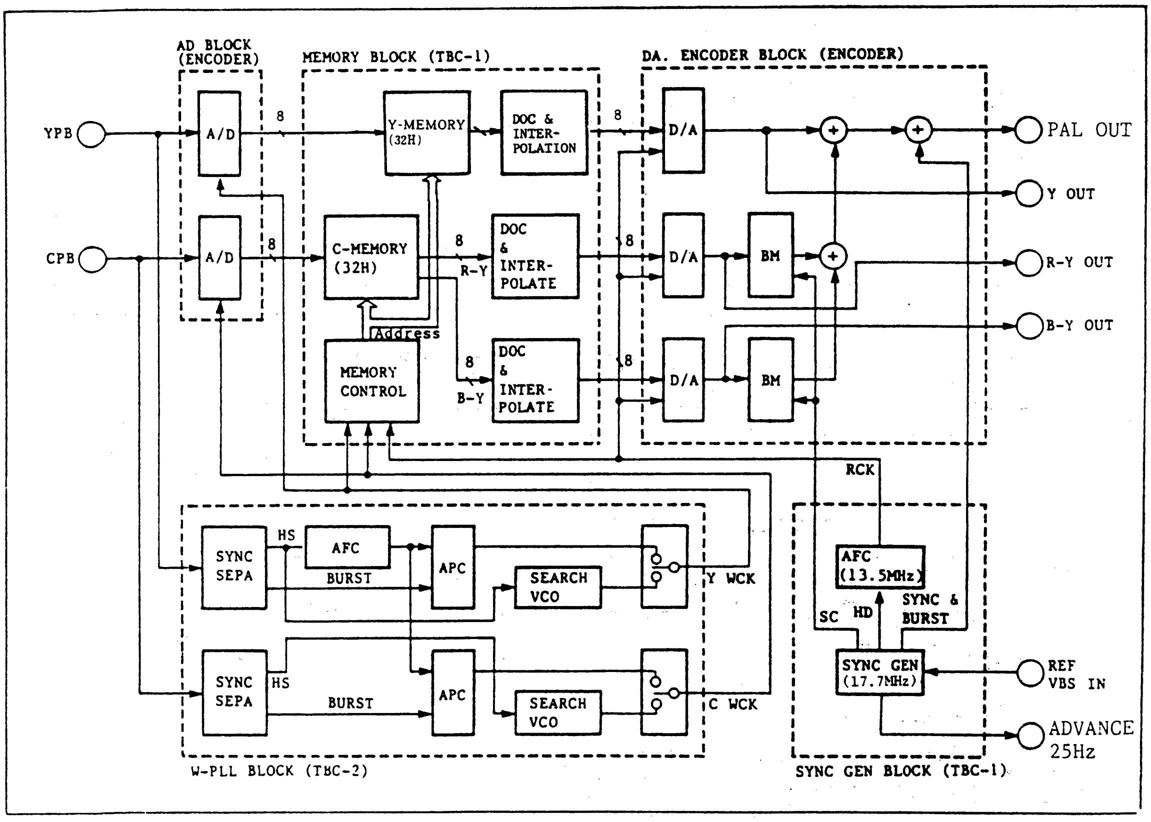


Fig. 9-37 Over All Block Diagram

Figure 9–38 shows the memory block diagram of TBC1.

The memory part of the TBC has four principal functions, as described above. Three types of newly developed gate arrays are used in TBC1, to significantly reduce the numerous quantity of discrete IC's that would be required to perform these functions.

The memory block diagram is shown in figure 9–21. Y and C signals utilize the same gate array's. IC2 and IC24 are identical memory controller IC's. While IC44 and IC67 are identical DOC and interpolation IC's. 8–bit Y and C signals, input from the encoder, are parallel converted collectively with the drop–out signal, from the Y P.B and C P.B circuit. 54 BIT words are produced which correspond to 6 video samples of 8 bits each (48 bits), plus 6 DOC bits (one for each video sample). These 54 bits are taken as one block and stored in memory. In other words, 54 bits of data are allocated to each address. In the same way, reading is done in 54–bit blocks. Y signals are converted to 18–bit signals. The 18–bit signal is configured in the following fashion: 2x8–bit video samples (16–bits), plus 2 DOC bits (2–bits).

Converted signals are sent to the 1H memory circuit for drop–out compensation and line interpolation, according to the designated mode.

During writing, Pr signals are stored in even memory addresses, while the Pb signals are stored in odd memory addresses. Sequentially reading the data at 1/2 the original write clock speed, achieves "time expansion" of the Pr and Pb signals. This is the inverse action of the CTCM function performed previously.

DOC and line interpolation is accomplished in the same manner as the Y signal, additionally CNC is done on both the Pr and Pb signals, individually. The signal is then output.

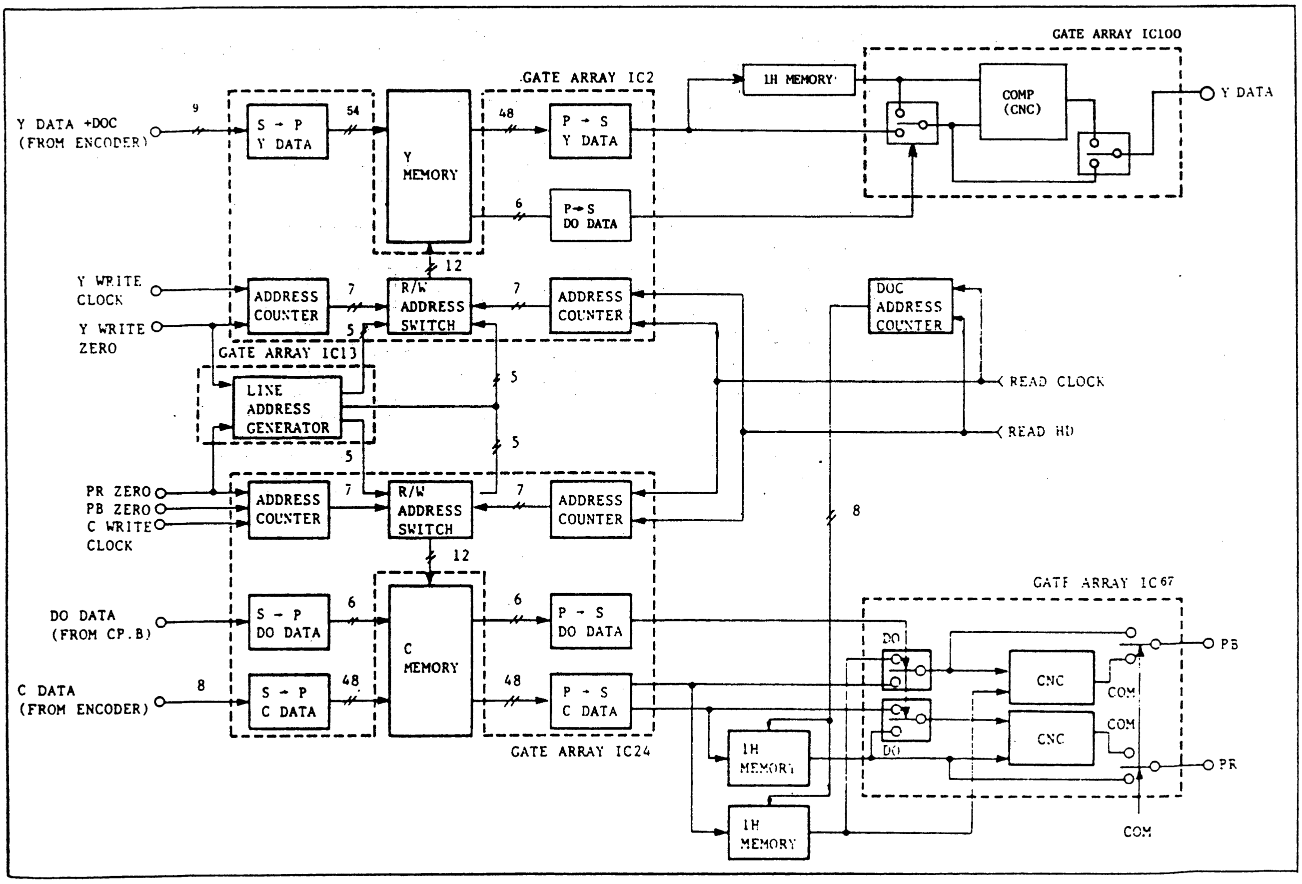


Fig. 9–38 Memory Block Diagram

The 4 main circuit functions are as follows.

9-3. Y/C SIGNAL TIME BASE CORRECTION

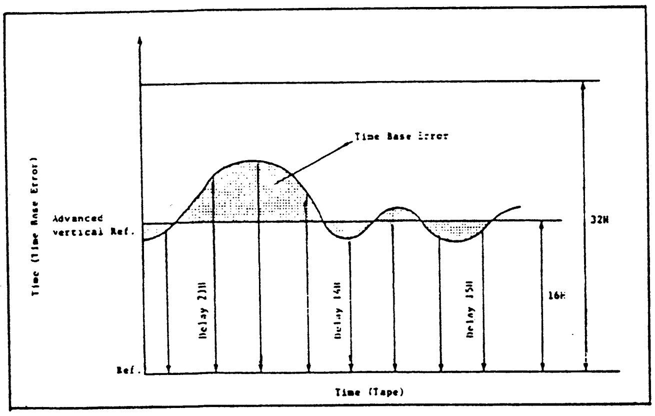


Fig. 9-39 . Principle of Time Base Correction

There are short-term time base fluctuations produced by variations in the rotation speed of the VCR head drum, and by tape stretch.

As shown in figure 9-39, this TBC circuit has a memory capacity of 32 lines (H). A 16 line advanced vertical reference signal keeps the P.B video centre within the 32H line correction window of the TBC. When writing data in memory, use of a write clock synchronized with H sync of the playback signal enables absorption of time base fluctuations (in H units) while writing. Figure 9-40 shows how time base fluctuations are corrected by varying the frequency of the clock. (A) is the normal clock (13.5MHz), (B) and (C) indicate that the clock frequency is changed in response to fluctuations of the time base (H instability). Writing is always performed at the same point.

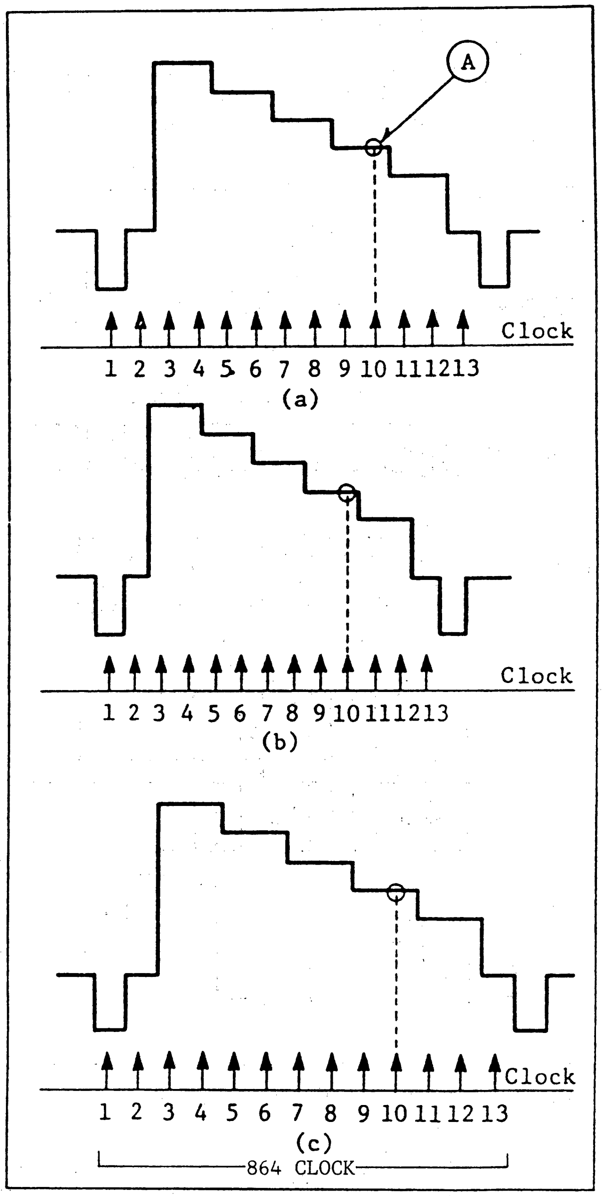


Fig. 9-40 Sampling Clock

9-4. Y/C SIGNAL DROP-OUT COMPENSATION

Y/C signal drop-out compensation is performed using the 1H memory circuit. The principle of this circuit is as follows. Signals, delayed by 1H, are continuously stored, and if a drop-out occurs, the previous line signal is read from memory. It is substituted for the missing information, thereby compensation is performed.

These signals are corrected inside gate array IC100 (Y signal) and IC67 (C signal).

The differences between the Y signal and C signal circuits are as follows. Y signals are A/D converted with a 13. 5MHz clock and C signals with a 6.75MHz clock. 1024 bytes of memory are required for the Y signal and 512 bytes each for Pb and Pr signals.

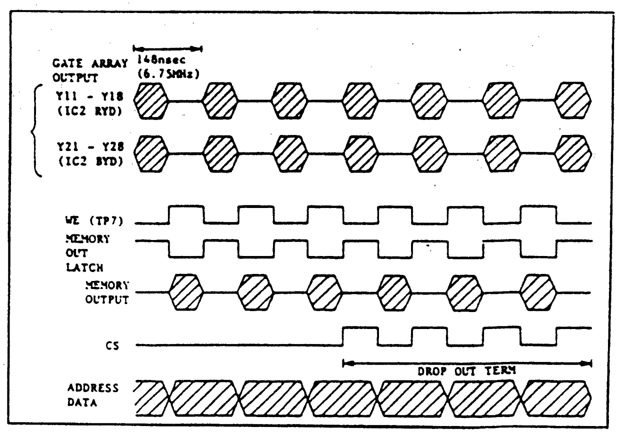


Fig. 9-41 1 H Memory

9–5. C SIGNAL TIME EXPANSION

Signals in the MII format are stored through time compression (CTCM) of the chroma component signal (Pr & Pb). During P/B these signals must be expanded.

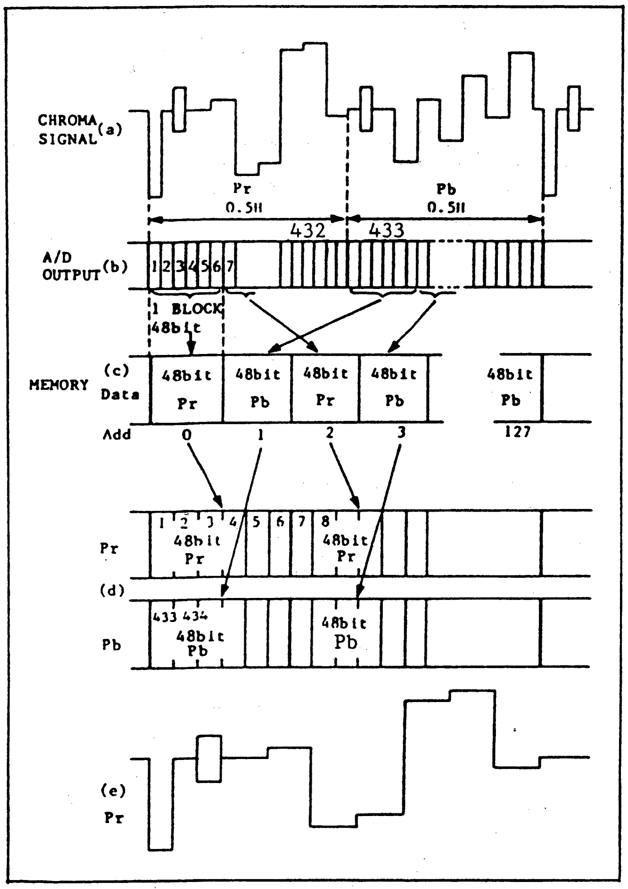


Fig. 9–42 C Time Expansion

The C signal expansion process is shown in figure 9–42. (A) shows the CTCM signal (Pr and Pb compressed to 0.5H each). Theses signals are converted to digital signals by the A/D converter , and the output is shown in (B). Because of the access time limits of the memory used, 6 bytes (video samples) are stored in memory as a 48 bit unit. In other words, 6 bytes are converted to a 48 bit parallel word, and stored in memory at a 3.375MHz rate. This allows the data to be clocked in at the lower rate of 3.375MHz. At this time, Pr signals are stored in even numbered addresses, and Pb signals in odd numbered addresses (C). Simultaneous reading enables time expansion.

9–6. Y/C SIGNAL LINE INTERPOLATION PROCESSING DURING AT PLAYBACK

9–6. DETAILED DESCRIPTION

A large percentage of processing (memory data and control) is performed in the newly developed gate array. Operation of these gate arrays is explained using block diagrams.

The following is the Y signal flow.

Y signals, A/D converted by the encoder (8–bit), are input to the memory circuit together with a drop–out pulse (1–bit) from the Y PB circuit. The input data (8 bits + 1 bit) is parallel converted using a 13.5MHz write clock signal synchronized to the playback signal generated by TBC–2 and a write start signal (Y W zero). The converted data is sent to memory in a 54–bit block [(8 bits + 1 bit) X6 words]. Memory addressing is accomplished, using 12 bits (4096 addresses). The upper 5 bits determine the memory's line address (5 bits = 32H), and the lower 7 bits (128) indicate the horizontal address for each of the 6 video sample blocks. 128 addresses X 6 samples = 768 samples/1H. A 24K byte memory capacity is needed for storing 32 lines of the signal. 768 DOC bits are used for each line, for a total of 24K bits (4K bytes). In this TBC, however, 7 conventional memory IC's are used (8K X 8 each), so the aggregate capacity is 56K bytes, (although only 28K bytes are actually utilized).

Memory is S–RAM with a cycle time of 120nsec. For the lower 7–bits a 13.5MHz is created in the gate array and a 1/4 clock (3.375MHz) is generated. This clock serves as the horizontal address counter clock. Data is written into memory at the 3.375MHz rate. Line addresses (the upper 5 bits) are created by an external gate array (IC13). This is called the line address generator. Memory reading is controlled using a 13.5MHz clock synchronized to the REF VIDEO signal, delayed by about 16H. The READ HD signal is synchronized H with sync. As in writing, reading uses 12–bit memory addressing. Reading takes priority over writing. Since the processing speed of the DOC circuit is much higher, memory read out is done in 2 video sample blocks, of 18–bits each. This is comprised of 28–bit samples (16–bits), plus 2 DOC bits. Because of this, the data read out occurs at a rate of 6.75MHz.

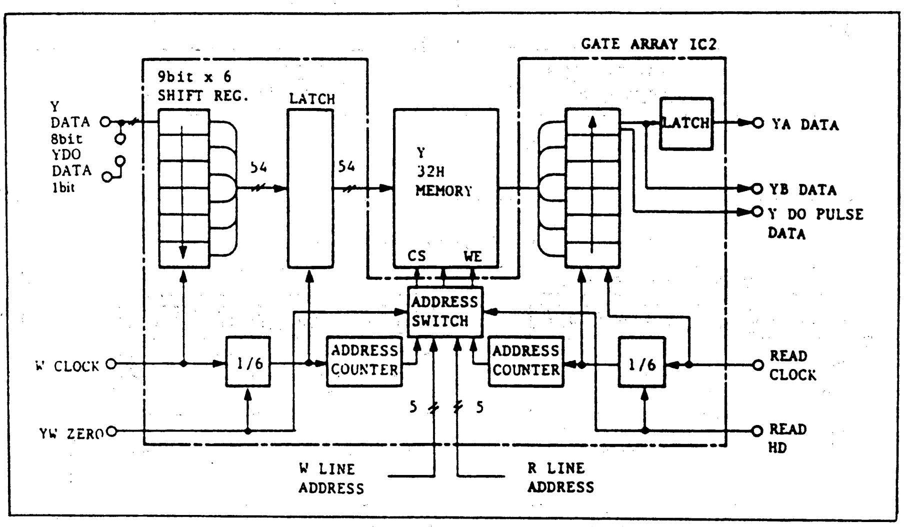


Fig. 9–44 Y Memory Control

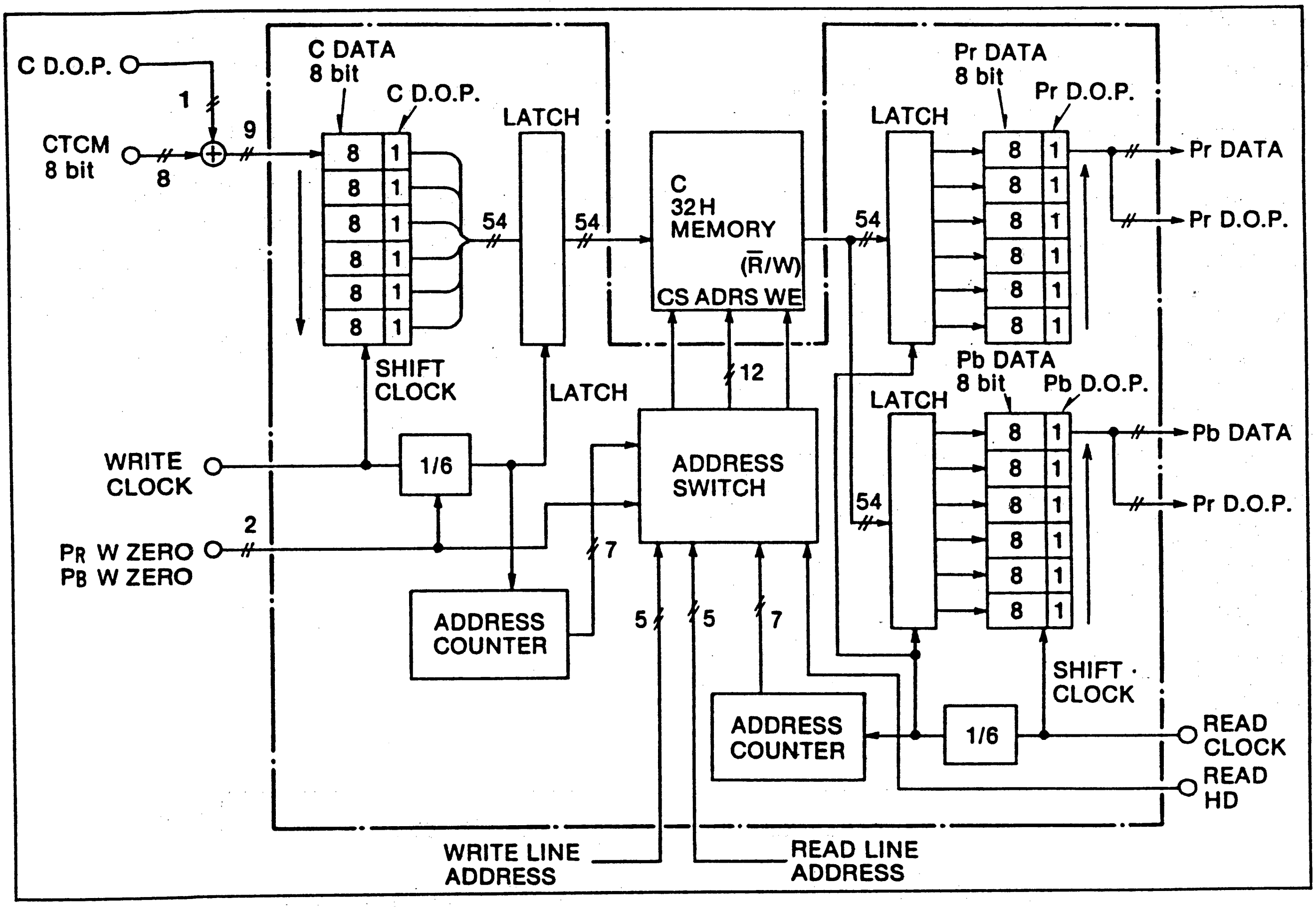


Fig. 9-44 (b) C Memory Control

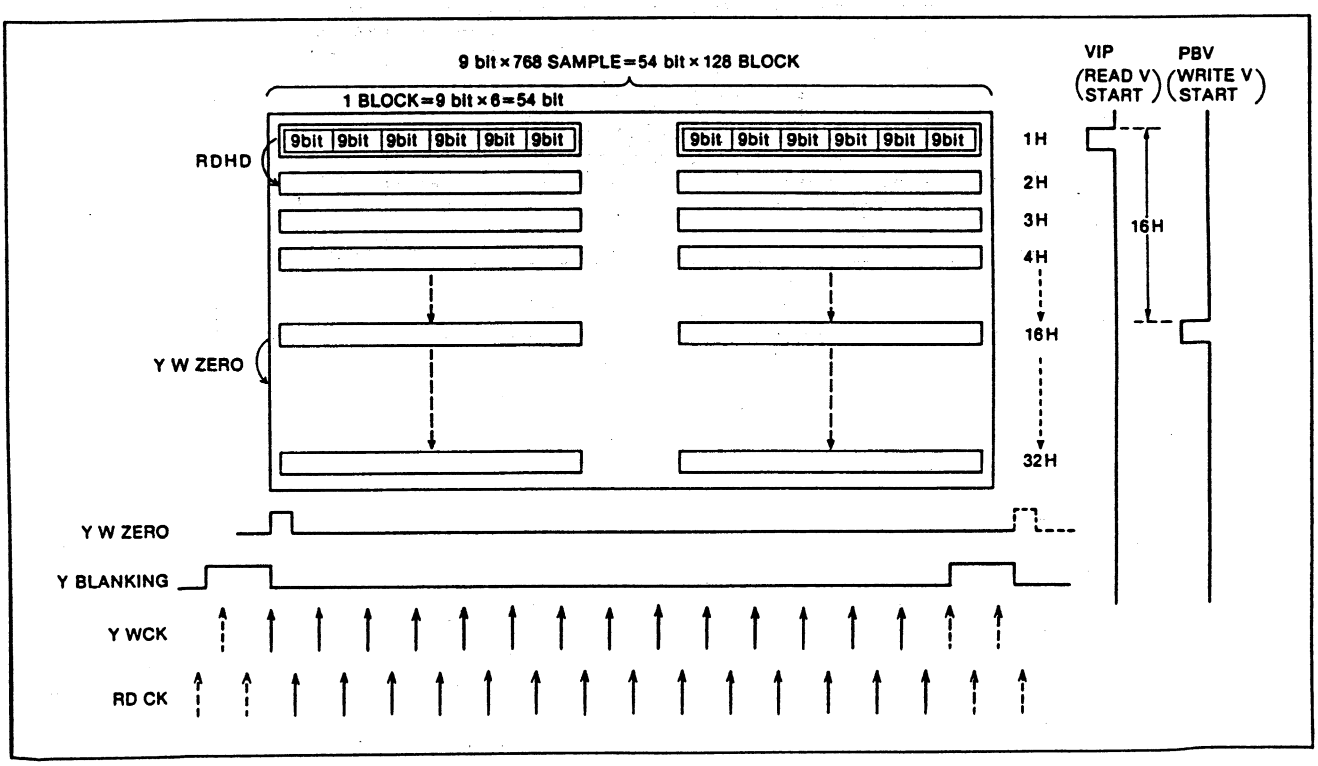


Fig. 9-44 (c) Y 32H Memory

9-7. DOC AND OUTPUT BLOCK

The 18-bit output data from the Y memory gate array is separated into a 16-bit (8-bits X 2) Y data signal, and 2-bits of DOC data.

This 16-bit Y data is sent to the 1H memory circuit. This circuit is used for both drop-out compensation and line interpolation processing. When the data that was stored as 2 bits of DOC information is read back, it is referred to as drop out pulses (DOP).

Figure 9-45 shows a block diagram of this circuit. it shows blocks for both Y and C signals. The circuits for Y and C are essentially the same, and addresses for both are generated based on the Y signal's read reference signal.

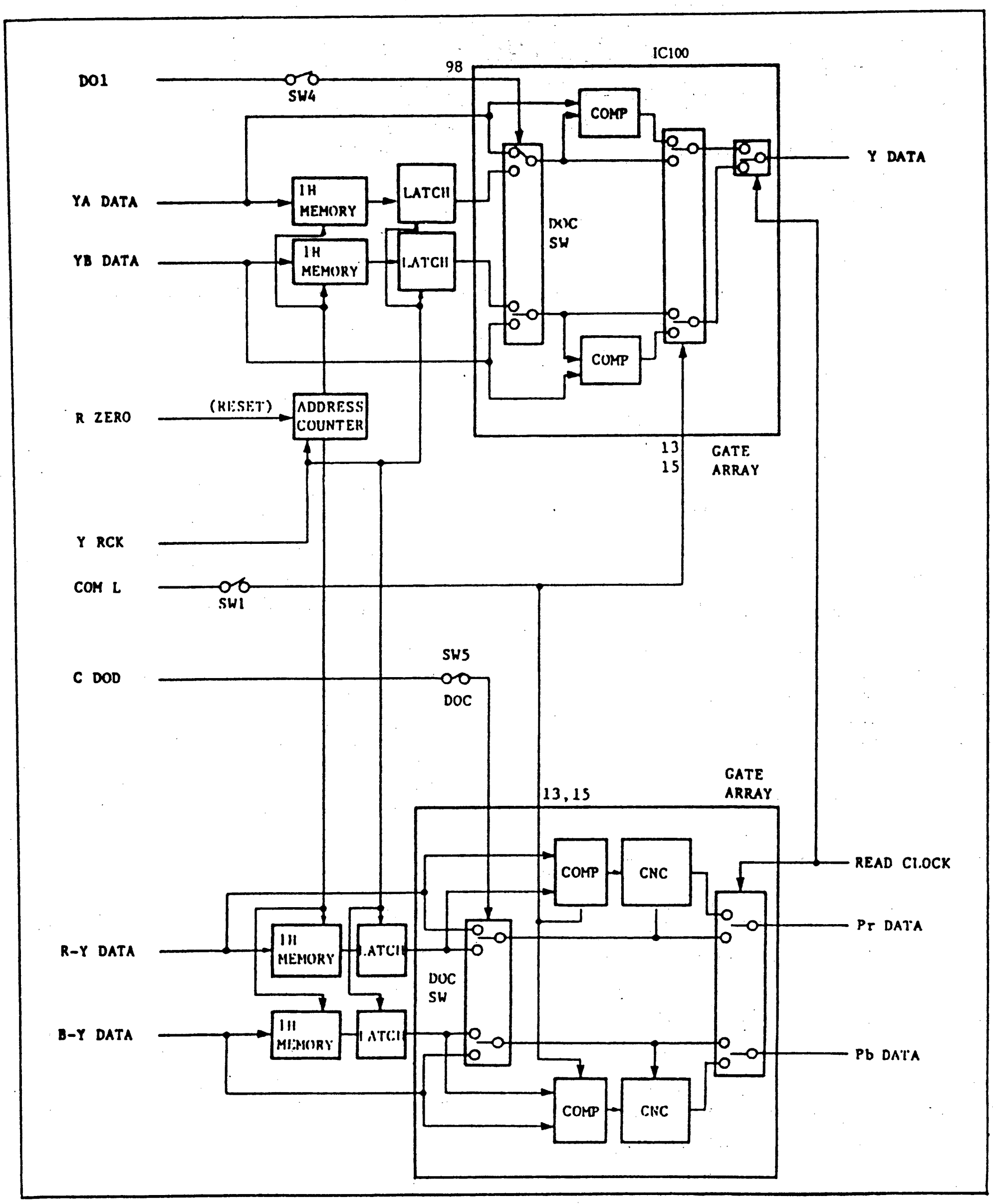


Fig. 9-45 DOC & Output

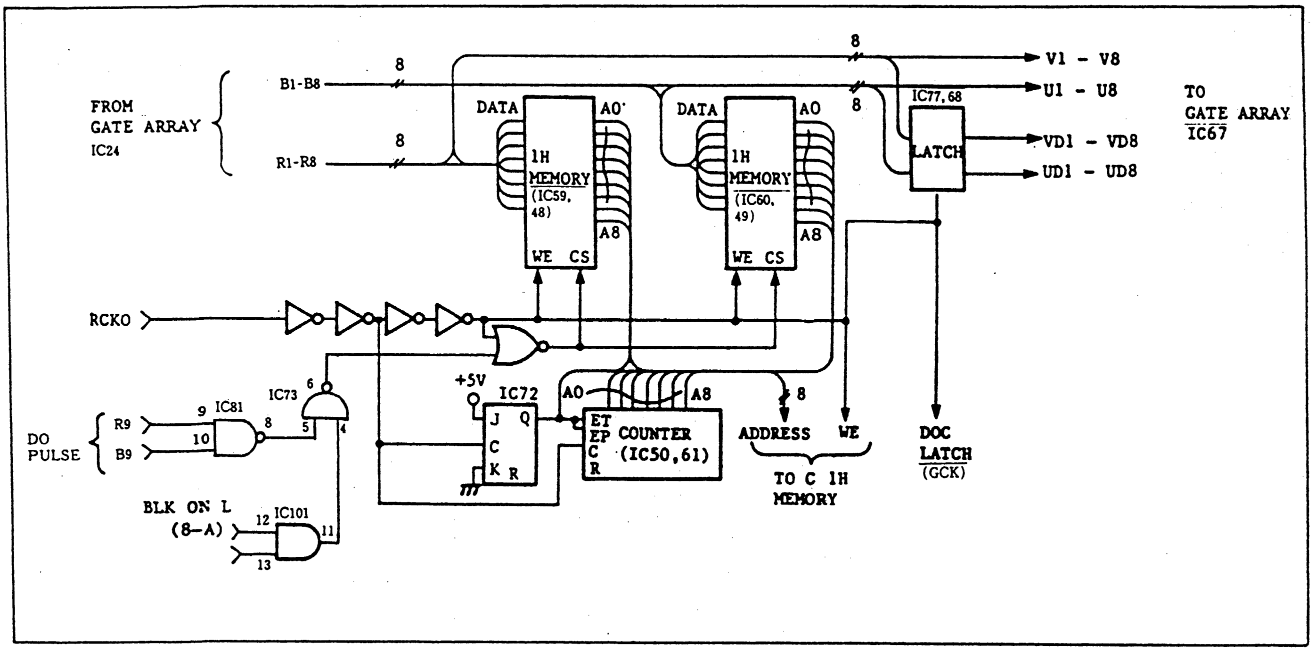


Fig. 9-46 1H Memory Circuit

Figure 9-46 shows the 1H memory circuit. Data for the Y signals is output from the gate array IC2 at LYthe 6.75MHz rate. This data is divided into 2x8 bit units, Y11-Y18 and Y21-Y28. Which are sent to the two 1H memories. These memories use static RAM with a cycle time of 55nsec. Address data input to this memory is created from the 6.75MHz RCKO signal generated by the read clock. This 6.75MHz clock utilizes the J-K flip flop of IC72, and the counter of IC50 and IC61.

512 (9-bit) addresses are generated, although only 432 of these addresses are actually used. This is because the Y signal requires only 2 sets of 432 byte (864 total) memory to store 1H, while the Pr and Pb signals require only 432-bytes for each 1H.

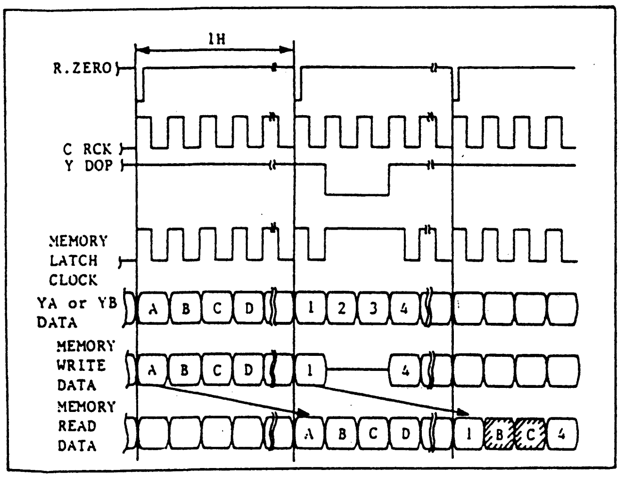


Fig. 9-47 1H Memory Timing

Figure 9-47 shows a timing chart for this circuit. Time corrected signals from the gate array are output at a 6.75MHz rate and, as shown in the diagram, data and high impedance states are output every half cycle. When the write enable (WE) signal is high, data is read from the 1H memory. The memory address is changed as shown in the diagram. During drop-out, the chip select input (CS) goes high even if WE is low, preventing new data from being written during that period. In this case, data, which was already stored in this address from the previous line, is retained. This valid data will be used instead of the drop-out, thus compensation is achieved.

In this way, 2-bytes of new data and 2-bytes of 1H previous data are sent to the gate array for output at the cycle time of 6.75MHz. Correction is done using 1H previous data when DOP signals DO1 and DO2 (pins 10 and 11) are an active (H), DOC action can be inhibited by SW4, as shown in figure 9-45.

Line interpolation is also performed in this gate array. This switching is done when the COM ON (L) signal is sent from the TBC-2 board to pins 13 and 15 of the gate array.

Finally the two 8-bit parallel "Y" samples are alternately clocked out of the gate array by the 13.5MHz read clock, in order to restore the "Y" signal to serial 8-bit samples (at a 13.5MHz rate).

9–8. C SIGNAL

C signals pass through almost the same circuit and are output. However, the difference is that time expansion and digital noise reduction is accomplished. The memory control gate array (IC24), used for the C signal, is the same as for the Y signal.

Since the C signal is taken from a different track than the Y signal, it could contain unrelated time base errors. Due to this possibility, the C memory control gate array receives a write clock, and both Pr and Pb start signals, which are generated by the C PB signal. When the C PB C signal is digitized, the Pr samples are written into to "even" memory address locations, while Pb samples are written to "odd" addresses.

During read out, the "even" & "odd" addresses are output at 1/2 the write clock frequency (6.75MHz). This action re–expands, and separates, the 0.5H compressed signals back into 2 channels. Each one having 1H of information.

C signals pass through the digital noise reduction circuit in the gate array. Selection is done by turning on and off.

9-9. LINE ADDRESS GENERATOR

This circuit is used to generate the write and read line addresses for the TBC's memory. It is also responsible for assuring that the read start address is the same as the write address. These functions are accomplished using a gate array and a P-ROM.

As shown in figure 9-49, Y and C memory write line addresses, are generated by a counter, and clocked by the Y write zero signal. The read line addresses are produced by a second counter, using the reference horizontal drive signal. Reading a particular video line out of memory occurs 16 lines after it was written. This relationship is fixed by the advanced vertical reference signal, sent to the VCR's servo. The reasoning for this, is to prevent the reading and writing line counters from becoming separated from each other. If that happens, they could fall outside of the 32 line memory capacity of the TBC.

Reading must also start from the same memory location (line address) at which the first line was written. This is accomplished by the line address generator circuit, as follows:

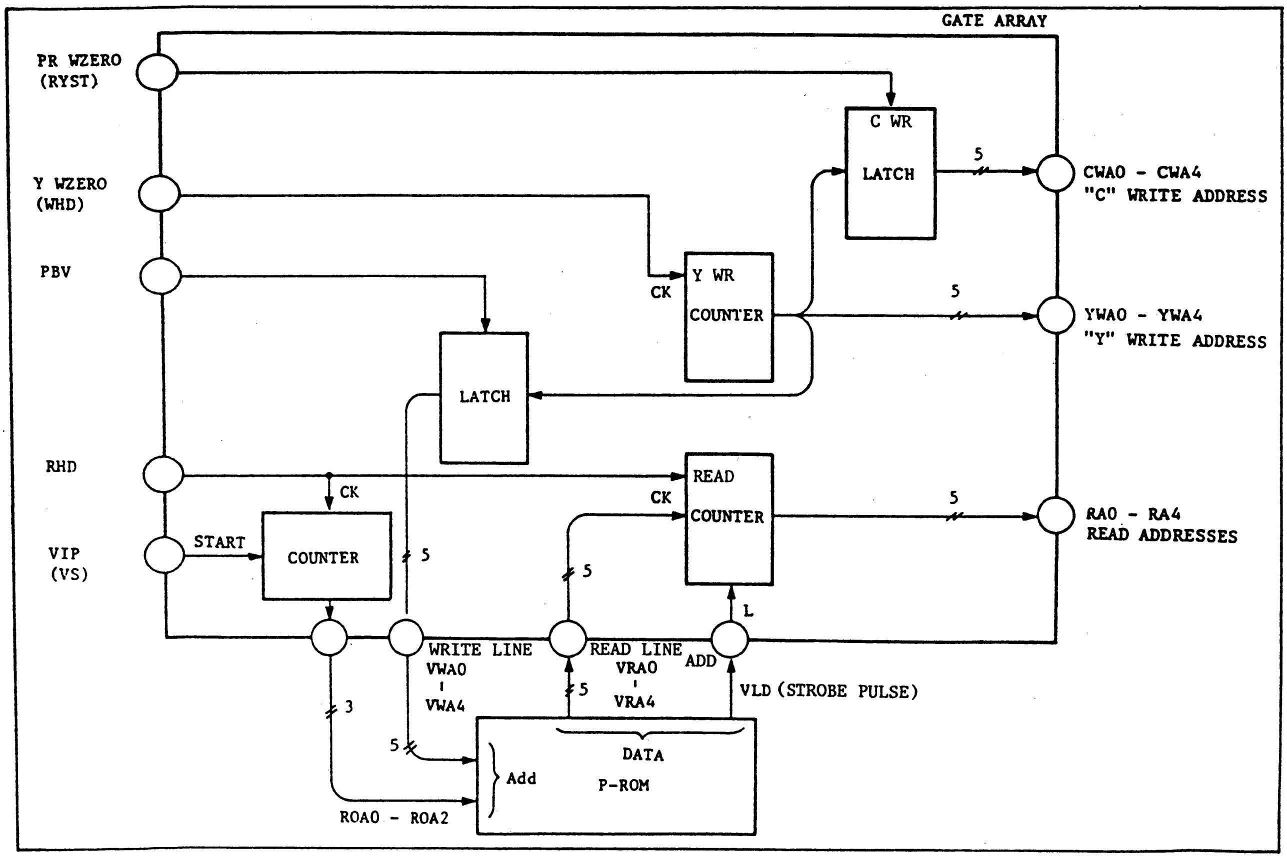


Fig. 9-49 Line Address Generator

The Y write line address is latched by the playback vertical signal, at the centre of video line 14. (The write line address can be any memory line address, locations 0 through 31). The 5-bit latched address is sent to the P-ROM which contains 32 tables of data. This 5-bit address selects 1 of the 32 tables. The tables start with line address data, which is 4 lines less that the desired write address. At video line 10 on the read side, a 3-bit counter, clocked by reference horizontal drive, commences counting. It's 3-bit output is also an address for the P-ROM.

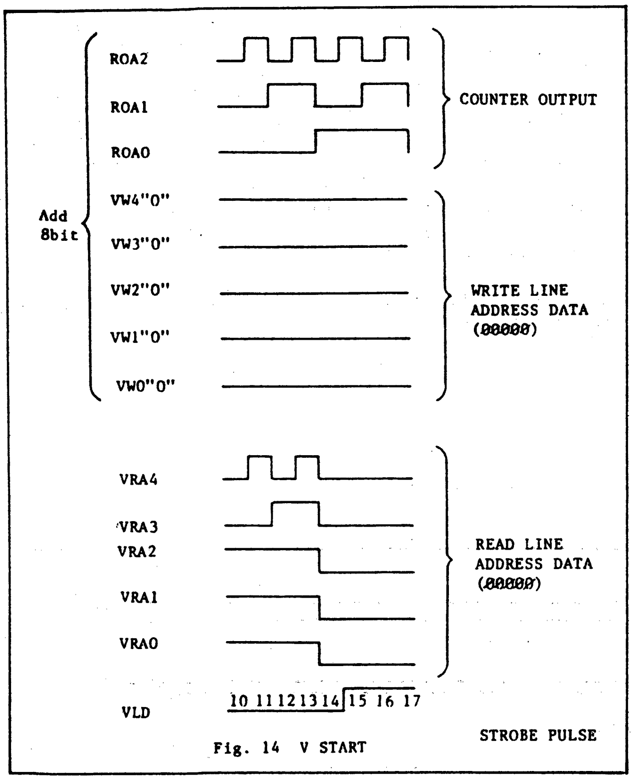


Fig. 9-50 V Start

At the fourth count, the data output from the P-ROM's table is the same as the original write start line address. This data, by means of a load strobe pulse, is naw loaded into the read line address counter. This counter now starts counting from the same memory line address that the first video line was written into. The counting up of Y addresses from P-ROM is done to synchronize the read counter with the jam loaded write address, in order to assure a stable read start address. Figure 9-50 shows the timing of the P-ROM's address and data lines.

TBC 2

9–10. GENERAL DESCRIPTION

This circuit generates 13.5MHz synchronized with the time base error of the playback signal, and performs time base correction through A/D conversion based on the above clock and writing to memory.
TBC2 (W PLL) Basic Block Diagram is shown in Fig. 9–51.

This circuit is approximately divided as follows:

1. V pulse generator.
2. Y write PLL circuit.
3. C write PLL circuit.

9–11. V pulse generator circuit.

This circuit uses the Y playback signal to develop the TBC–1 memory's vertical start pulse (PBY). A framing detection circuit is used to control line interpolation.

The TBC–2 board also produces a framing signal for auto H phasing, during editing.

The memory vertical start signal is a pulse generated at the centre of the 14th line, of the playback signal. This pulse guarantees that writing and reading of memory starts form the same line address.

The framing detection circuit for line interpolation creates a smooth signal, combining the previous 1H video signal and current signal, when the REF framing and playback framing differ.

In other words, if during special playback, the 2 field signals for which interlaced scanning is being performed are the same, the amount of information is the vertical sync signal will decrease. But so will the vertical resolution. Therefore resolution is increased by creating an intermediate signal through line interpolation.

The playback framing signal, for the servo circuit, is needed to adjust image H sync phase at the edit points. The number of H sync pulses occurring in a 1V period can change, depending on the selected mode (tape speed and direction). Subsequently, V sync information is needed at the same timing as the played back V sync. Therefore the information corresponding to each H sync state is stored in a P–ROM, and the V pulse generator circuit outputs this information. In this way a V pulse, synchronized with the playback signal is always generated.

Figure 9–53 shows a block diagram of the V pulse generator circuit.

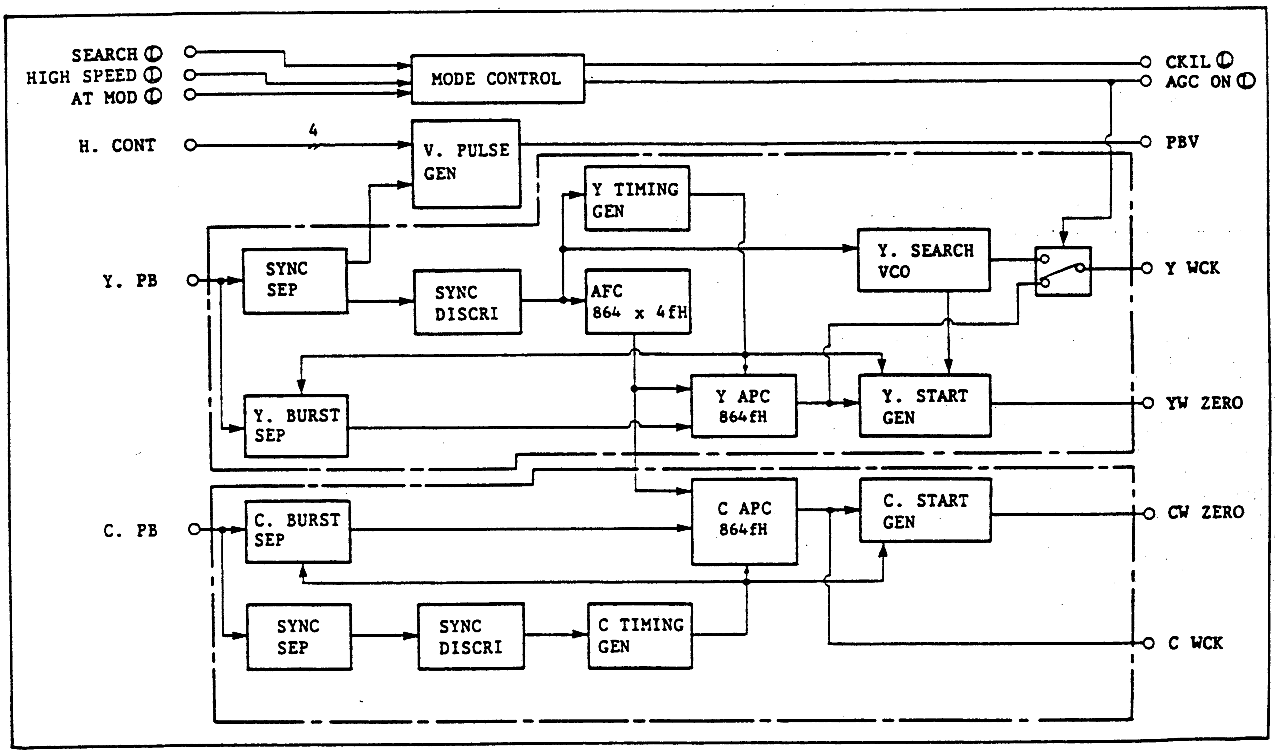


Fig. 9–51 TBC–2 (W PLL) Basic Block Diagram

IN/OUT	NAME	DESCRIPTION
L6→	SEARCHⓁ	Except ×1 PB Search mode Low
L6→	HIGH SPEEDⓁ	± ×8, ×32 Search mode Low
L6→	AT MODⓁ	Automatic Tracking mode Low
S9→	H. CONT	H sync Control data H sync number is changed in AT trick playback mode.
S4→	Y. PB	Luminance Playback signal after demodulator
S3→	C. PB	Chrominance Play back signal after demodulator
L1←	BLKⓁ	Blanking Low Signal. It is used to inhibit Drop out compensation in the search mode except AT mode.
L1←	CKILLⓁ	Color Killer Low. It is used to change to Black / White mode in ×8 and ×32 soarch.
L1←	PBV	Playback V sync. It is re-generated V sync from PROM (IC27) syncronized with playback V sync. This is used as memory write V start pulse onTBC (L1) board.
L1←	Y WCK (C WCK)	Luminance (Chrominance) TBC 32H Memory Write Clock. It is used for TBC memory write clock pulse. It's frequency is 13.5MHz and it is phase locked with playback H sync.
L1←	YW ZERO (CW ZERO)	Luminance (Chrominance) TBC 32H Memory Write Start (Zero) pulse for each H line.

Fig. 9–52 TBC–2 Overall Block Diagram Terms

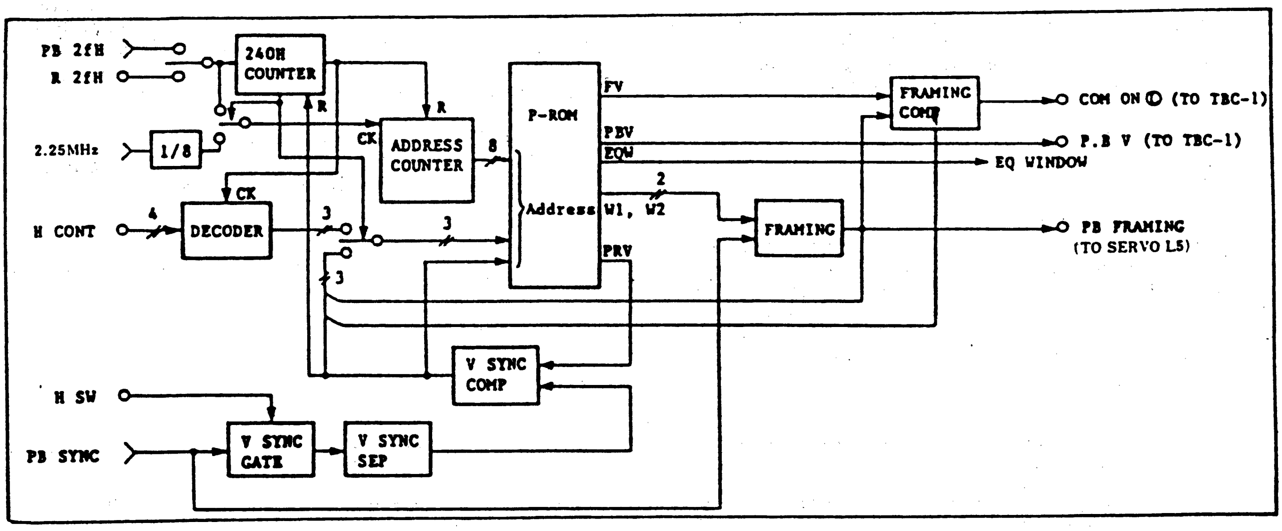


Fig. 9–53 V Pulse Generator

9–12. Y write PLL circuit.

This circuit generates a write start signal (Y W Zero) and write clock signal (Y WCK) synchronized with the playback Y signal. Thereby controlling the writing to the memory circuit. These write start and clock signals are essential for performing time base correction.

The principle of time base correction (TBC) is that writing is always done at a determined location in memory, using the clock and write start signals, synchronized with the P/B video. The MII system has enhanced component timing, by use of a 3.375MHz burst signal, which is added to each component. This is done during the horizontal blanking.

Figure 9–54 shows a block diagram of this circuit. The sync separator and burst separator circuits, strip sync and burst from the playback video signal. The sync discriminator circuit further separates out only H sync. A sync discrimination circuit, with a narrow reference window is used to prevent malfunctioning of the AFC circuit, due to drop–out or noise.

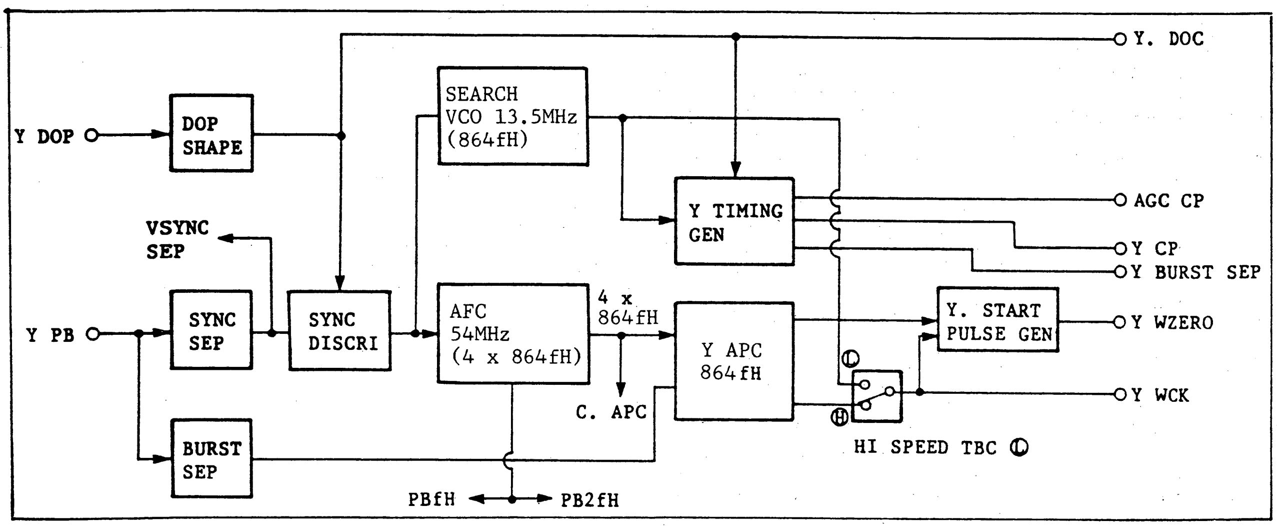


Fig. 9–54 Y Write PLL Block Diagram

A 54MHz AFC circuit, locked to H sync is divided by 4, which yields a 13.5MHz clock. This clock is, in turn, phase locked to the 3.375MHz burst, from the P/B signal. This now is used to develop the Y write clock and Y write start signals.

In high speed search mode (+/−,X8 or X32), a 13.5MHZ VCO is used to develop the clock signal directly. This is done because horizontal timing problems result from the video head jumping across tracks (skew errors). This search VCO is used to track this. NOTE: Phase control is not necessary, because only the Y signal is used and the colour is killed.

9–13. C write PLL circuit

The purpose of this circuit is to generate write start and a write clock synchronized with the playback C signals (in the same way as the Y channel). This will control writing to the memory circuits. The principle of C time base correction is the same as for Y signals. The exceptions are that 4 cycles of burst are added to both Pr and Pb signals prior to CTCM.

In this way, a 3.375MHz burst signal is added to both the Y and C signals. This prevents the timing problems that occur between the Y, Pr and Pb signals. This was previously a weak point of the colour time compression multiplexing system.

The write PLL circuit for C signals receives a 54MHz clock from the "Y" AFC circuit. The APC creates 13.5MHz, synchronized with the playback C signal. This is done, via the 3.375MHz burst of the C signal. The reason for using 54MHz from the "Y" AFC circuit is, there is little difference in time base errors between Y and C signals.

The APC circuit compares the burst, which occurs twice per compressed line, and a burst is available for timing each signal component (Pr & Pb).

Figure 9–55 shows a block diagram of the C write PLL circuit.

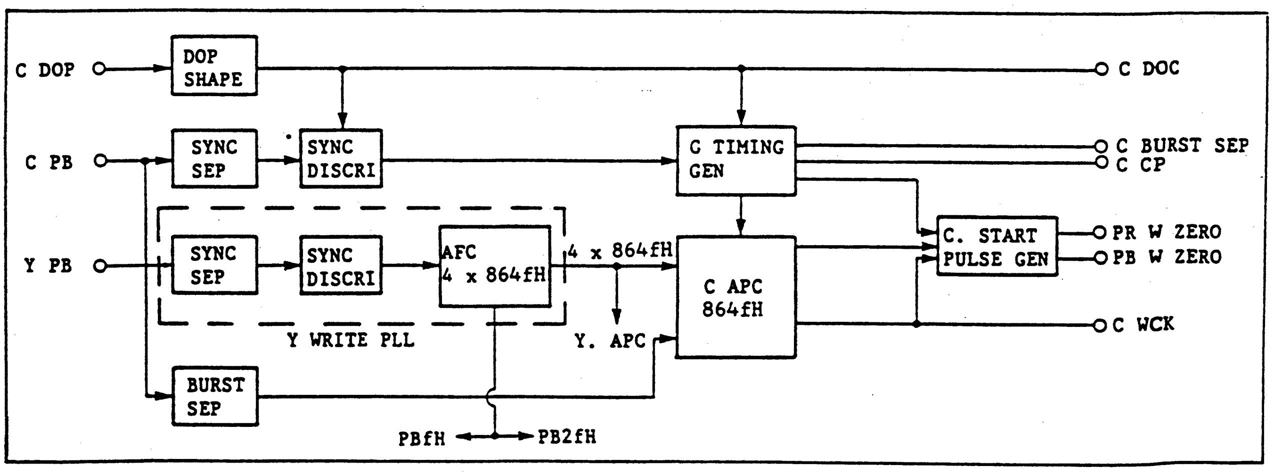


Fig. 9–55 C Write PLL Block Diagram

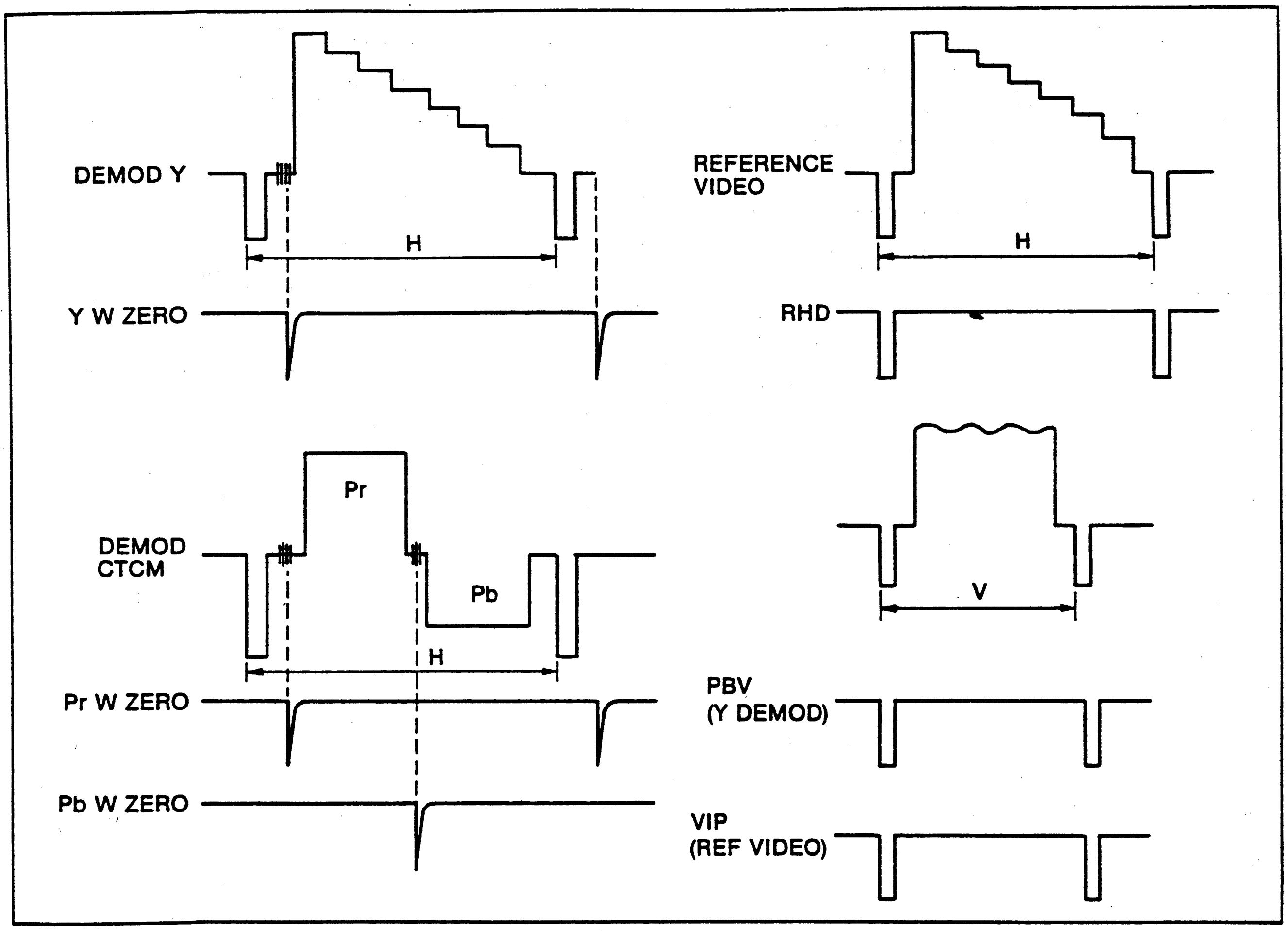


Fig. 9–56 Timing of Signals

TBC–2

DETAILED DESCRIPTION

The purpose of the TBC–2 circuit is to generate a 13.5MHz clock, synchronized with the playback signal and start signals for writing video signals to memory. In this way, time base correction is performed by writing to memory, signals synchronized to playback video.

The explanation of the TBC–2 circuit is divided into the following sections.

1. V pulse generator circuit.
2. V sync separator circuit.
3. Y/C H sync discriminator circuits.
4. AFC circuit.
5. Y/C APC circuits.
6. Search VCO circuit.
7. Y/C timing generator circuits.
8. Y/C start generator circuits.

9–14. V PULSE GENERATOR

The P–ROM IC27 is the heart of the vertical pulse generator. All pulses produced by this circuit are obtained by reading data from this memory. Address bits A0 through A7 are produced by binary counter IC25 and IC26, and are common to all modes. Mode selection is done by address bits A8 through A12.

Clock selection (IC22) is done to obtain high frequency clock (3.375MHz divided by 8), for high precision data read out (Well defined pulses of short duration), during the vertical blanking interval. This is done with address bit 11 low. When the binary counters reach their maximum count, and overflow address bit 12 is set high, the clock is switched to 2FH. Address bit 12 is latched high by D type FF (IC24). The Q output of IC24 also controls IC22 to select the clock pulse.

In the normal mode, the 2FH is derived from the playback signal.

The switch from high speed clock to 2FH occurs on line 15. From this point on the counters increment at a lower rate the count continues for 480 clocks, or 240 horizontal lines and then stops. The counters, IC25 and IC26, remain reset until the playback vertical sync arrives, and the process repeats itself.

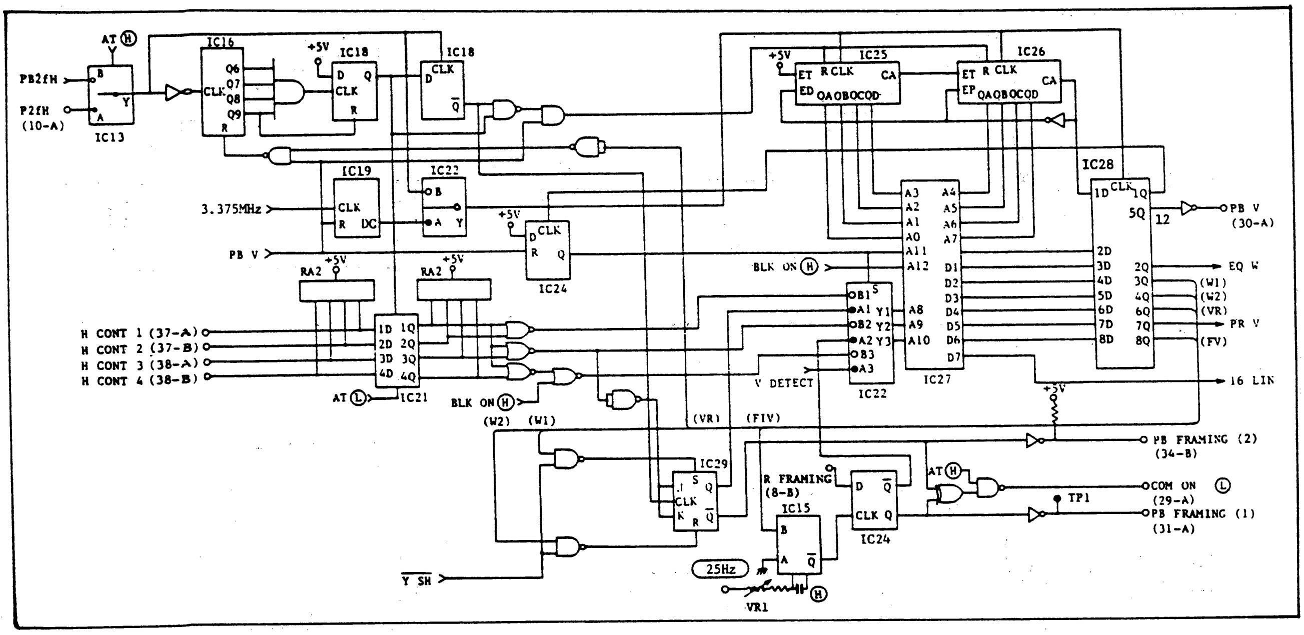


Fig. 9–57 V Pulse Generator

Playback horizontal sync is gated with 2 window pulses (W1, W2), to set, or reset FF IC29. The Q output of this FF is the playback framing 2 signal (high, for odd fields). Also generated in this portion of the circuit, are playback framing signals for line interpolation (COM ON), and auto–H phase operation, during editing (playback framing 1).

9–15. V SYNC SEPARATOR CIRCUIT

The main function of this circuit is to produce a vertical start signal for the TBC–1 memory. Secondary functions are generation of the playback framing signal for auto H phase alignment at edit points.

Figure 9–58 shows the circuit for separating V sync from the playback video signal. The playback video signal is input to TP4, after sync separation. A head switching signal is input at the same time (TP2). Both its edges are detected and a window of about 7H width is created with MMV IC10. This circuit enables removal of pre–head switching vertical sync, that can occur in certain AT modes.

R17 and C28, along with level comparator IC4, separate vertical sync pulses. The output if IC4 is filtered more, before being used to trigger IC10, the DOP will prevent any output from this circuit, by triggering MMV IC14.

The V lock detector circuit has two outputs, a PB vertical pulse and a DC voltage. The DC voltage is to indicate that the number of H is between 312.5 and 320 lines. When V sync is lost, this circuit substitutes a pseudo V pulse in its place. In the search mode, IC13 selects PR–V from the pulse generator as the pseudo V pulse.

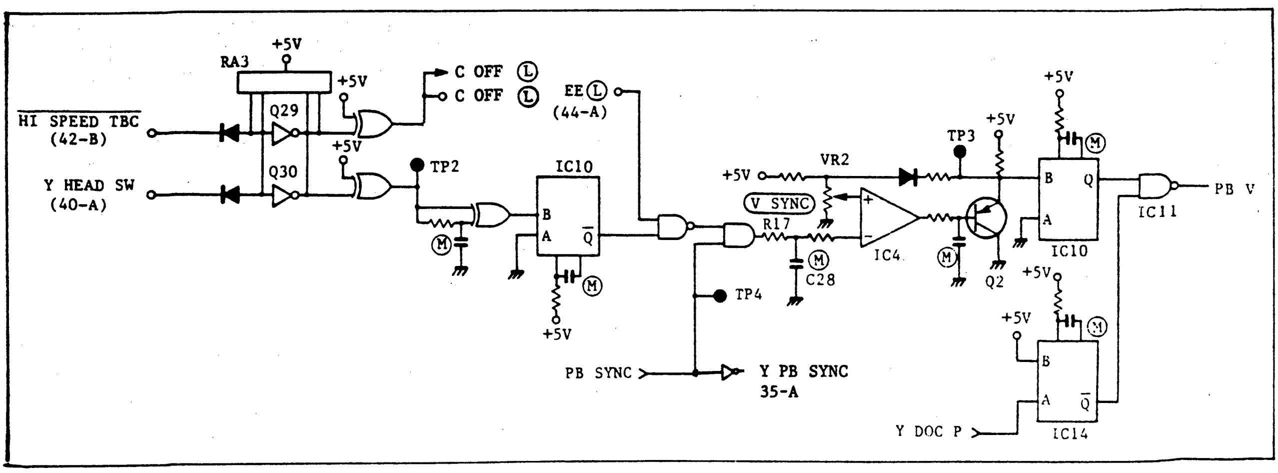


Fig. 9–58 V SYNC Separator

The circuit operates by creating a constant current source, with IC4 and Q1, and a sawtooth wave with capacitor C20. C20 is discharged by the PR–V signal from the pulse generator. This sawtooth waveform is buffered and then sampled by vertical sync. The voltages developed on capacitors C21 and C22 are buffered and applied to the window comparator in IC8.

The output of this comparator is high when the number of H is between 312.5H and 320H. In the non–AT search mode, V information (PR–V) of the V pulse generator is used as the pseudo V pulse. IC14 is a retriggerable monostable and as long as V sync is present, the monostable is triggered, and will prevent pseudo V from being output.

9–16. Y/C H SYNC DISCRIMINATOR CIRCUIT

The purpose of this circuit is to pass only stable horizontal sync information, and to remove noise and pulses produced by dropouts.

Figure 9–60 shows a block diagram of the Y H sync discriminator circuit.

Only horizontal sync is separated from the input video signal. Before separated sync is applied to the discriminator circuit, equalizing pulses, following vertical sync are removed with the EQ Window signal. The sync then passes through a 2 level narrow window comparator circuit, for separation of stable horizontal sync. Only H sync, with the normal period, is gated through. In this way the AFC circuit will not malfunction due to noise or dropouts.

Figure 9–61 shows the sync separator circuit. Y playback signal is input to the buffer IC30 (A) and it's output is then sync separated by IC31, Q4 and Q5. The signal is then sync tip clamped by the FET Q3, whose output becomes the feedback to IC3 (A) through IC30 (B).

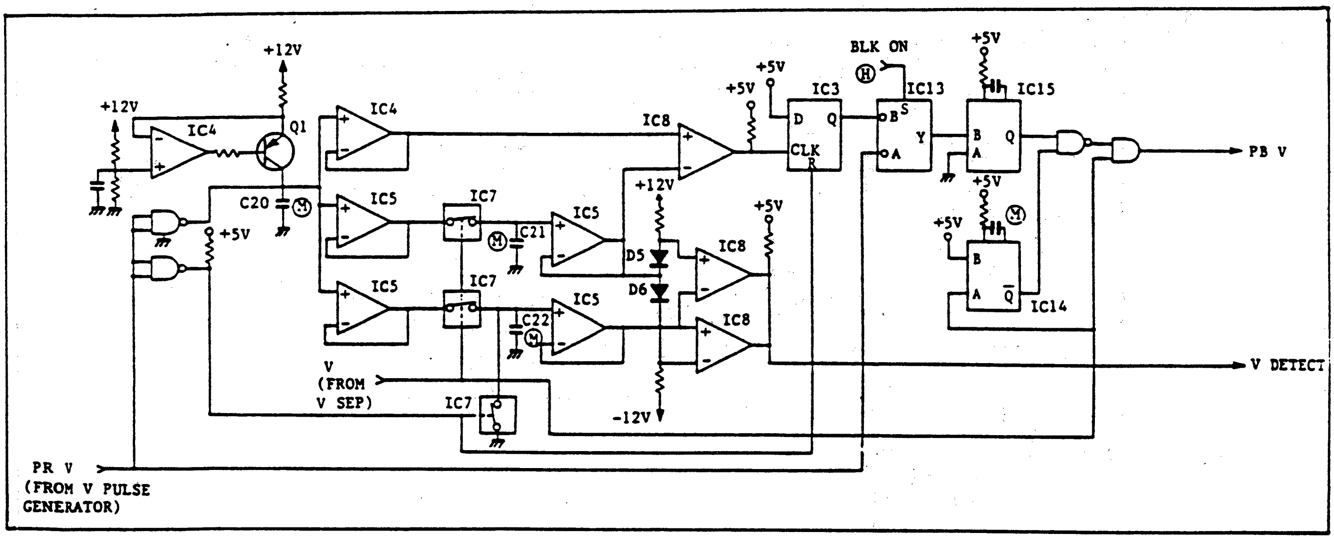


Fig. 9–59 V Lock Detector

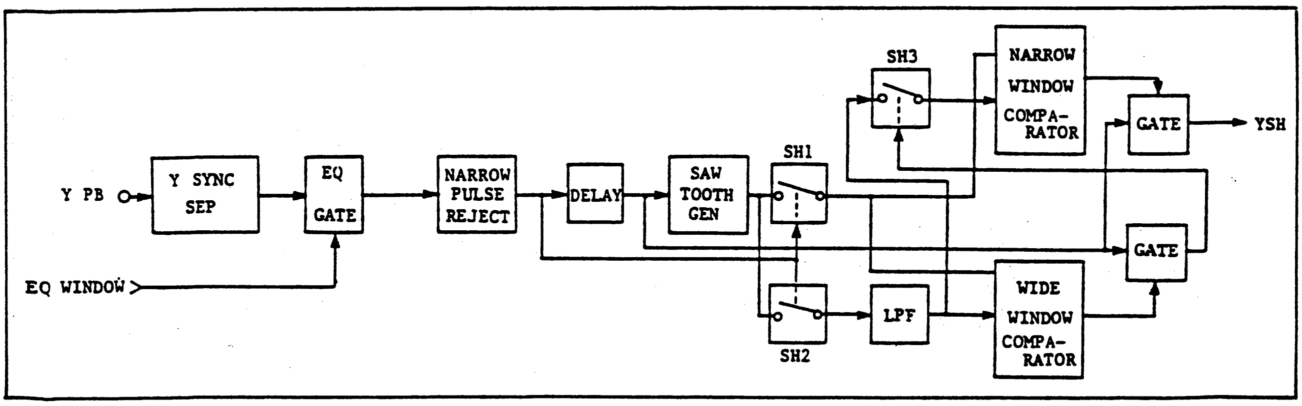


Fig. 9–60 SYNC Discriminator

The buffer output of IC30 (A) also is applied to the trigger circuit comprised of Q6 and 7, which then is applied to IC33 (the delay MMV). It's Q output is the input to the sample pulse timing MMV, which becomes the S/P input to the pedestal sample slice IC32. Its output is now held by the capacitor C40, and is the reference for sync separation. By this method, level slice is done at the same point consistently.

Please refer to figure 9–62. Playback sync from the sync separator is applied to the trigger input of IC41. This monostable multivibrator and IC43 form a circuit for extracting the rising edge from sync. The output from IC43 is then gated with the equalizing pulse window, to remove the equalizing pulses following vertical sync. After gating out the equalizing pulses, noise that can occur due to over modulation is removed by a filter, composed of R57 and C49.

The signal is then input to a gate with a capacitor and resistor on it's output. This capacitor/resistor combination gives a slope to the leading edge of sync. Two comparators with different reference voltage inputs, sample this slope at different points. This generates two pulse outputs, with differing leading edge timing. Variable resistor, VR3, is for adjusting this delay. IC47 and Q8 form a constant current source for charging capacitor C56. This capacitor is discharged by delayed sync. The charging and discharging of this capacitor produces a sawtooth wave, whose peak to peak voltage represents the time interval between sync pulses.

Before the capacitor can be discharged however, the peak value of the sawtooth is stored in capacitors C57 and C58. Sampling is done by IC48, which is controlled by the lower MMV (IC46).

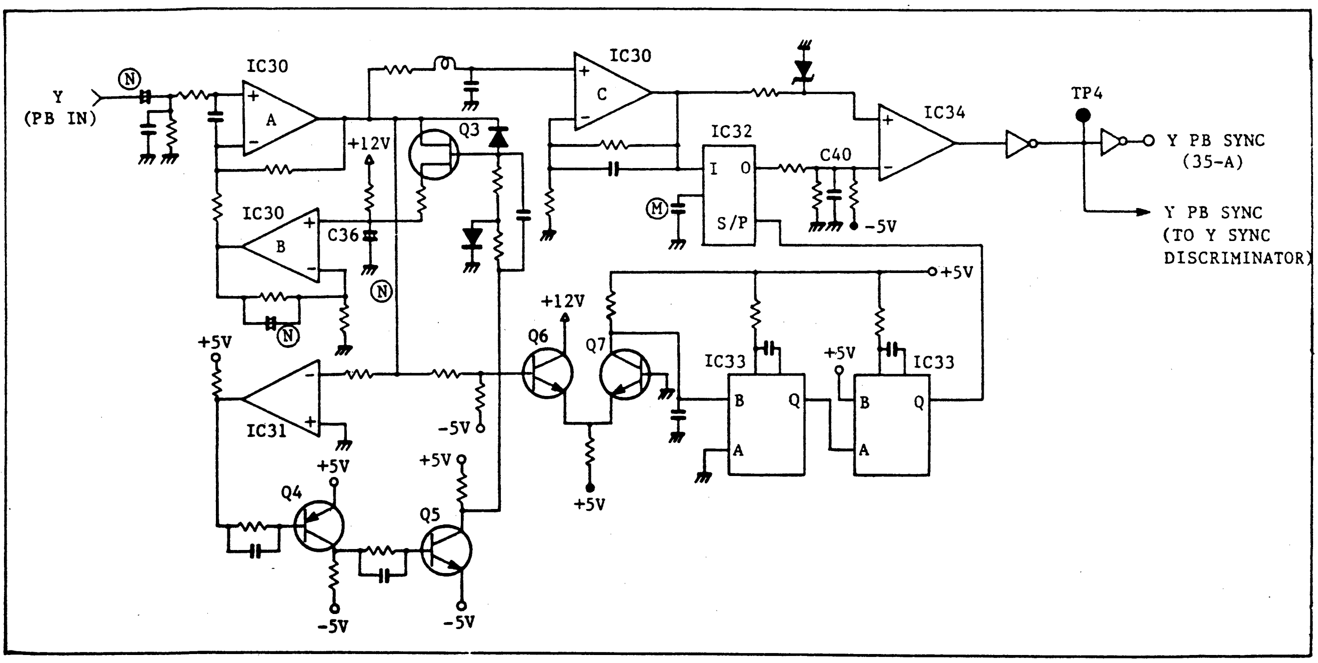


Fig. 9–61 Y SYNC Separator

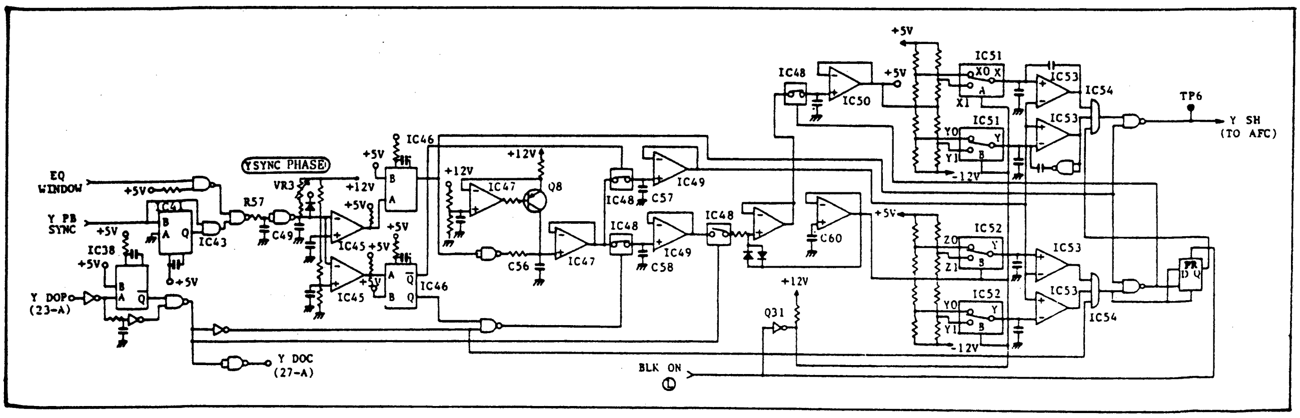


Fig. 9–62 Y SYNC Discriminator

The voltage on capacitor C57 is buffered by IC49, and then used as the sample input for all four comparators in IC53. These comparators are paired up with plus and minus inputs, in opposition, to form window gates. DC levels, above or below their respective reference voltages, will produce a low output and will not allow sync to pass.

The lower two comparators form a wide window gate (+/−6usec.), that is combined with the DOP. The wide window gate then allows the narrow window gate (+/− 2usec) to sample the peak sawtooth voltage.

The BLANKING ON input is low in the search mode (non−AT) to make the sample window for both comparators wider by, operating switch IC51 and 52.

Figures 9−63 and 9−64 show the sync discriminator timing, and the action of the sawtooth wave in eliminating pulses that do not occur when they are expected. The result is a sync output that can be used by the write AFC circuit.

9−17. AFC CIRCUIT

The purpose of this circuit is to generate a 54MHz master clock, locked to playback horizontal sync. This clock is then sent to the APC circuit to become the 13.5MHz clock, phase locked to the burst signal.

A diagram of this circuit is shown in figure 9−65. In this circuit a 54MHz VCO is phase locked to playback horizontal sync. The 54MHz VCO output is then divided by 4, to produce a 13.5MHz output. The 13.5MHz output is divided by 864, to produce a horizontal rate pulse. This pulse is framed into a sawtooth by Q15, Q16 and Q17. The two op amps in IC72, buffer this sawtooth, and the switches in IC71 store the sampled voltage in two separate capacitors. Sampling is accomplished by the pulse output of MMV IC69. The second half of IC69 detects the presence of sync.

The time constant of this retriggerable MMV is 270usec and will always remain latched, as long as continuous sync is present. Loss of sync will switch in the longer time constant.

The error voltage is then buffered and filtered, by 3 op amps in IC73. The processed error voltage is then applied to a varactor diode D26 to control the frequency of the VCO.

IC 81, 82 and 83 improve the phase response of AFC circuit.
When the skew occurs, this circuit generats the fH signal which locked to the horizontal sync.
IC 84 is a driver which dirives the input clock (10.59 usec) by 3 and 6.

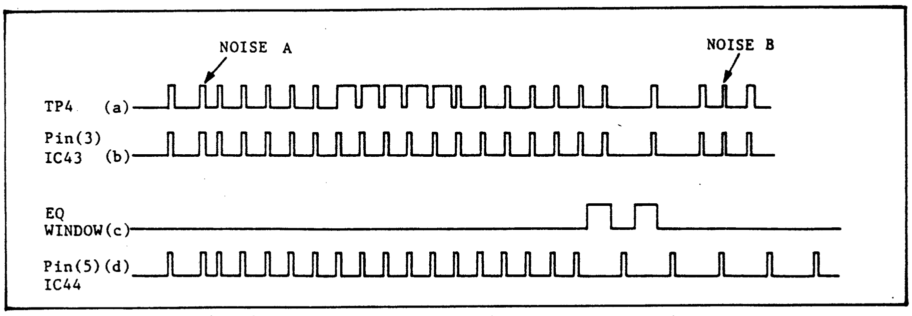


Fig. 9−63 SYNC Discriminator Timing (1)

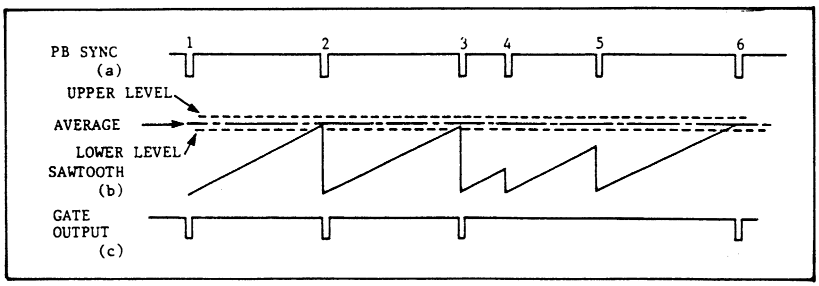


Fig. 9−64 SYNC Discriminator Timing (2)

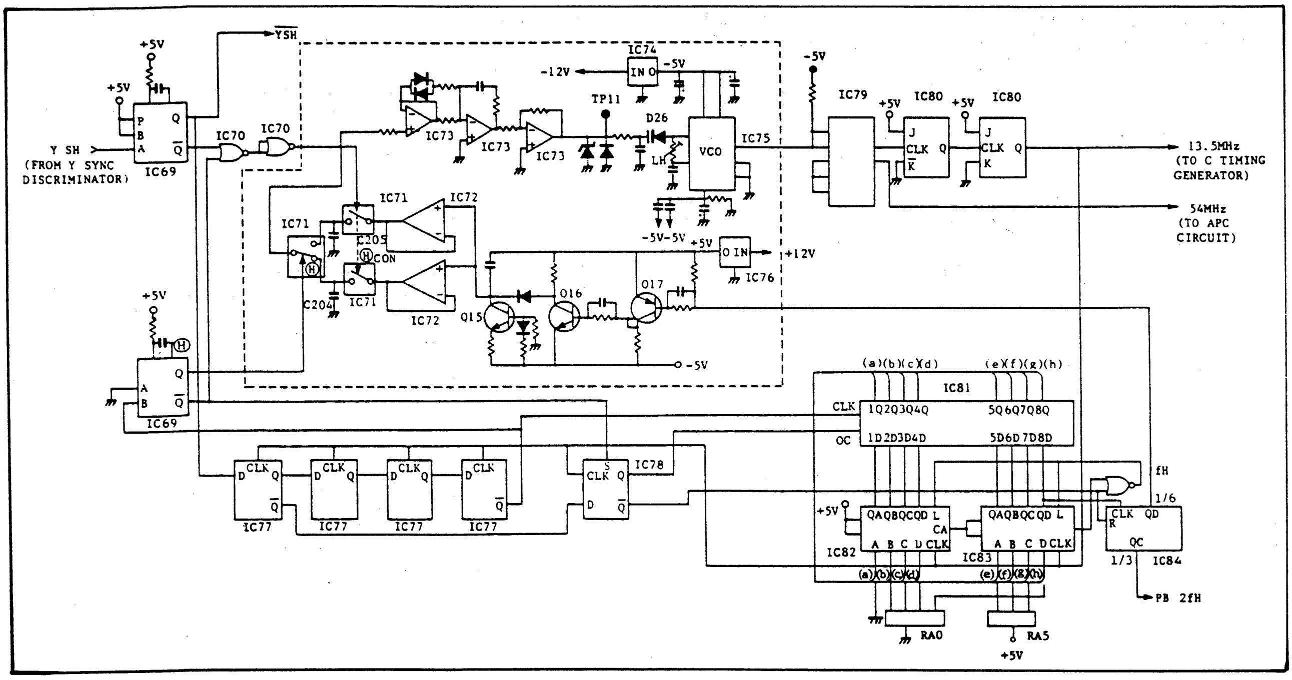


Fig. 9–65 AFC Circuit

9–18. Y/C APC CIRCUIT

This circuit uses the 54MHz master clock, created by the AFC circuit, to generate a 13.5MHz write clock, phase locked to the burst signal.

This circuit can be divided into 2 main sections. The first separates the burst signal from the played back video signal. The second creates 13.5MHz, locked to this burst signal.

The differences between the Y and C signal circuits, is that the C circuit has input available for Y/C timing adjustment, and their burst separation circuits are different. The explanation given here focuses on the C signals.

The burst separation circuit, for C signals, is shown in figure 9–66. The H sync part of the input C signal is blanked with IC96. The signal then passes through a 3.375MHz BPF, where only the 3.375MHz component passes through. The waveform is formed and converted to TTL level. Only one sine wave of the burst pulse is removed, using the burst separation pulse. The burst phase informaition is sent to the APC circuit.

13.5MHz, synchronized with burst phase, is created with this circuit, so the 54MHz master clock is frequency divided signal will only match the burst phase in 54MHz clock units. Therefore, the signal enters a phase lock circuit, employing a gate circuit delay so the phases can be matched.

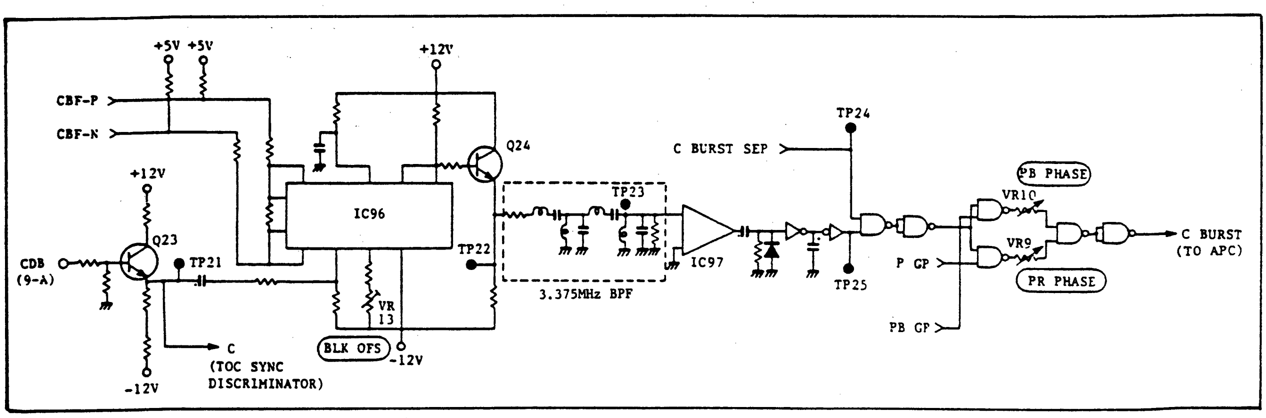


Fig. 9–66 C Burst Separator

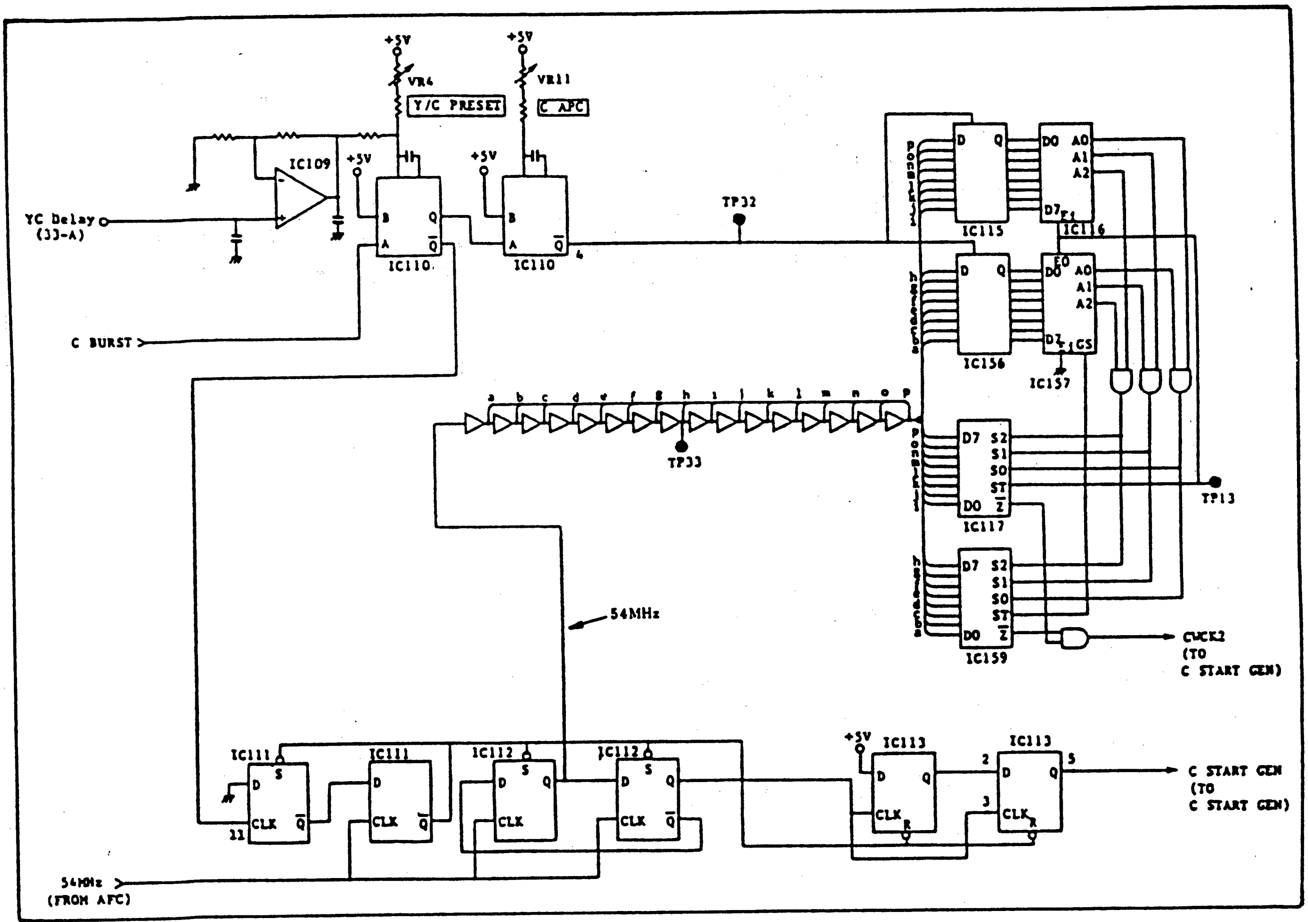


Fig. 9–67 C Digital APC

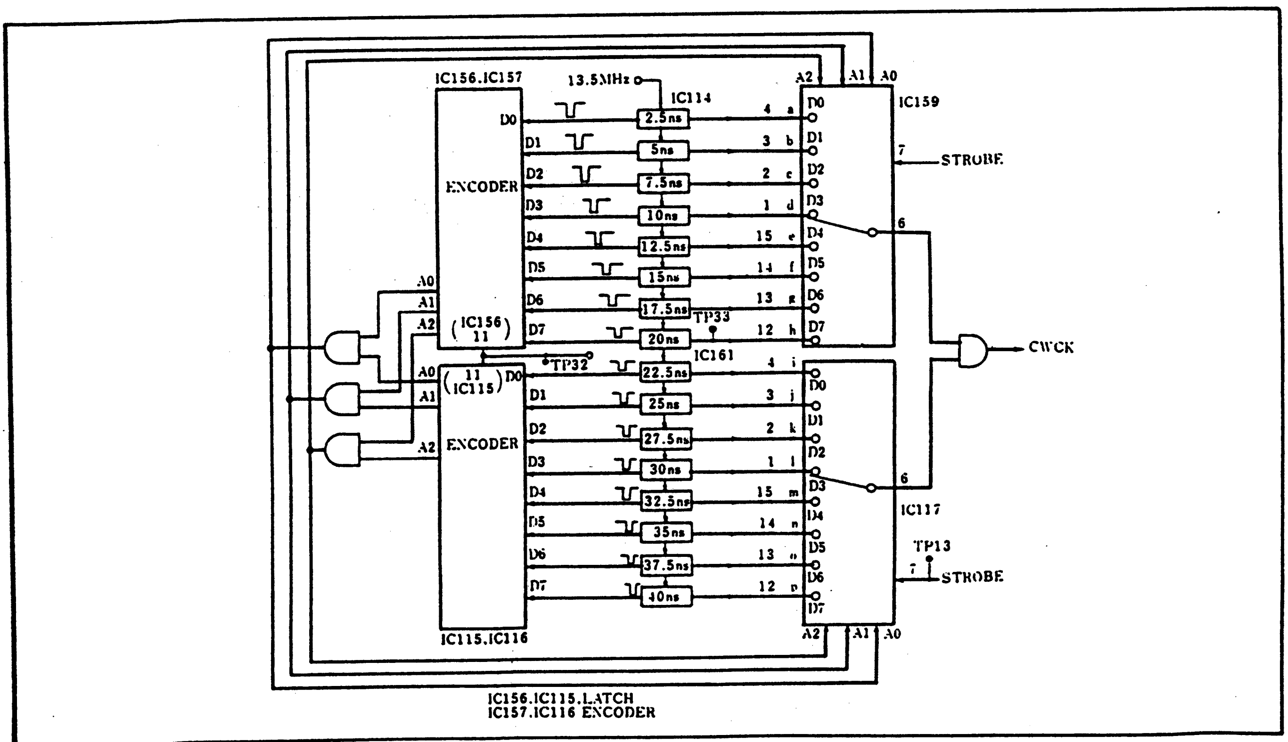


Fig. 9–68 C Digital APC Block

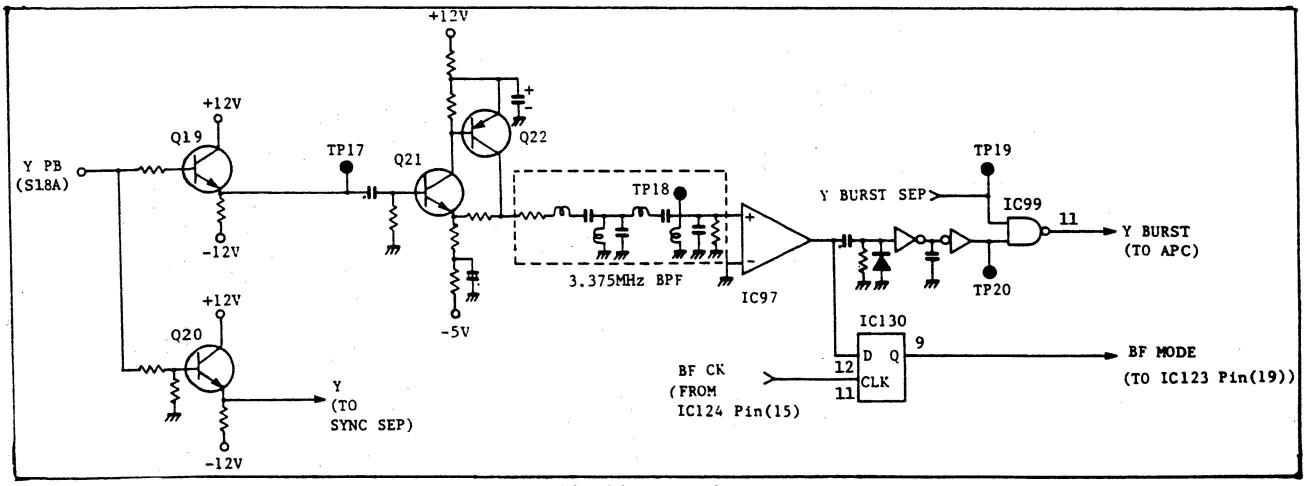


Fig. 9–69 Y Burst Separator

The principle of this circuit is as follows. 16 different signals delayed by 2.5nsec are created, using the gate circuit delay, and the output clock (13.5MHz). 2.5nsec units are removed by selecting one of the 16 signals, by the burst signal. As shown in the circuit diagram, the 16 different timing signals (A–P) are generated, matched and latched to the burst timing by IC115 and IC156. This output is encoded by a priority encoder, that in turn, selects one of the 16 phases to be used as the clock signal (IC's 117 and 159). This is selection of a changing output, with the same timing as the latch pulse.
Figure 9–69 shows the burst separation circuit for Y signals. In the Y signal circuit, signals are directly input to a band pass filter. A wave form is formed from this output in the same way, and burst removes only one wave.

The D–flip–flop of IC130 is for burst position detection, and the position of the burst separation pulse is matched to the burst position by outputting this data.

9–19. SEARCH VCO CIRCUIT

The search VCO generates 13.5MHz clock signals for Y time base correction when the AU–650B is in the "high speed search mode" (+/–, X8 or X32). Clock signals for CTCM are not needed, because the output is B/W in the high speed search mode.
A charge and discharge type VCO is used to expand the lock–in range of the oscillator. The search clock is phase locked to H sync (Y SH), separated from the playback Y signal. The response characteristics are kept below 1 field's time duration, to allow it to track horizontal timing variations in the high speed search mode.
Figure 9–71 shows a circuit diagram of the Y SH signal (H sync information separated from the sync discriminator circuit), triggers the monostable multivibrator of IC86, and is input to the JK–FF of IC87. This FF is reset by the divided down VCO out 13.5MHz (divided by 852). The output Q(b) of IC87 is converted to a trapezoidal wave (c) using the time constant of R187 and C232.

The rising edge of this trapezoidal wave is sampled, using a pulse created from the Y SH signal. The error voltage developed, is stored in C234. The OP Amps of IC90 buffer, noise and LPF the error voltage. It does this before it is applied to the VCO.

C239 and R119 sets the free–run frequency and control is performed by the error voltage form IC90.

Figure 9–72 shows the timing chart for this circuit.

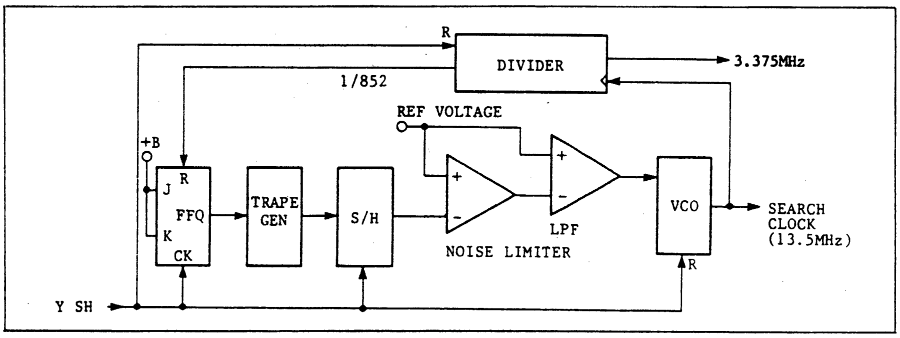


Fig. 9–70 Search VCO Block

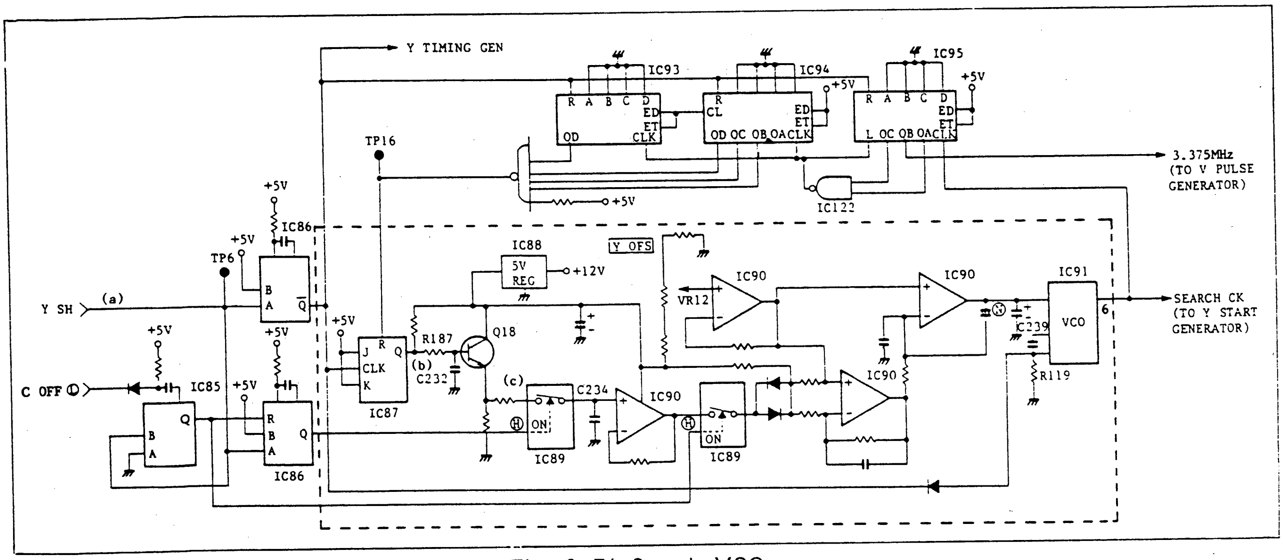


Fig. 9–71 Search VCO

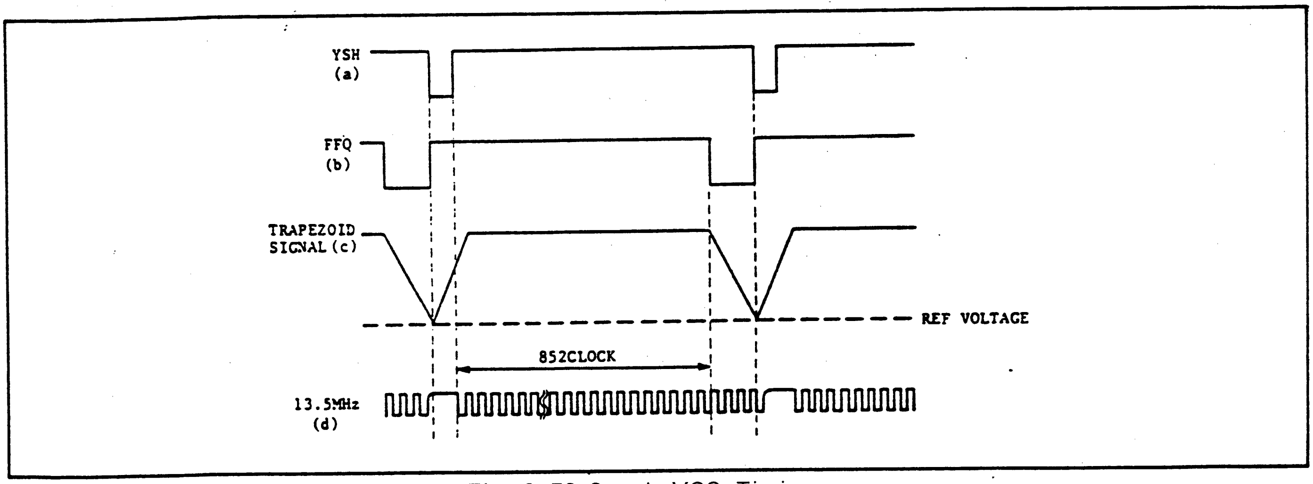


Fig. 9–72 Search VCO Timing

9–20. Y/C TIMING GENERATOR CIRCUITS

These two circuits create timing signals by reading data, from the P–ROM, using their respective H sync and clock signals.

Figure 9–73, shows the Y timing generator, while figure 9–74 shows its timing output.

This circuit creates the P–ROM addresses by using H sync information and clock signals generated by the search VCO. Data is output according to these addresses. The 13.5MHz clock used in this circuit, is from the search VCO circuit. The JK–FF (IC87) is reset with the input Y SH signal. When the FF is reset, the Q signal goes low for one clock cycle of 13.5MHz, and the binary counters of IC120 and IC121 start from a count of 0. The result is that the P–ROM address is incremented, and the contents of the different storage locations are output as pulses (256 x 4–bit).

The A8 address of this P–ROM is input from a circuit that uses the D2 pulse (BF–CK) to sample the bursts. In normal operation, this pulse samples the negative portion of 1 cycle of the burst, producing a low output. If jitter (or other instability) causes the timing of the burst to be shifted, and the positive peak of one cycle is sampled, the output will be high.

In this way, by changing the address, one can alter D3 (Y burst sep) pulse timing, so that a complete cycle of burst is separated.

The C timing generator circuit is similar, and is shown in figure 9–75.

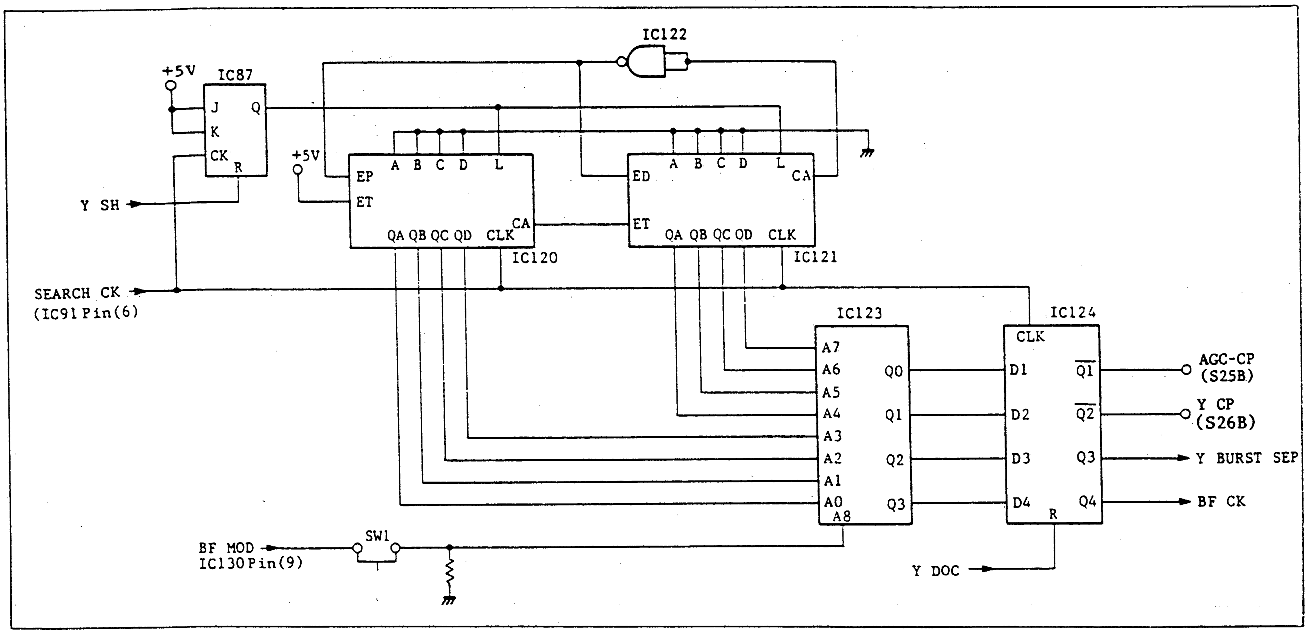


Fig. 9–73 Y Timing Generator (1)

The difference for the Y timing generator circuit is that 1 JK–FF is added to the address counter, to generate the addresses A0–A8. Similarly, timing pulses for the burst gate circuit are generated by IC85 and IC130. Figure 9–56 shows the output timing of the P–ROM.

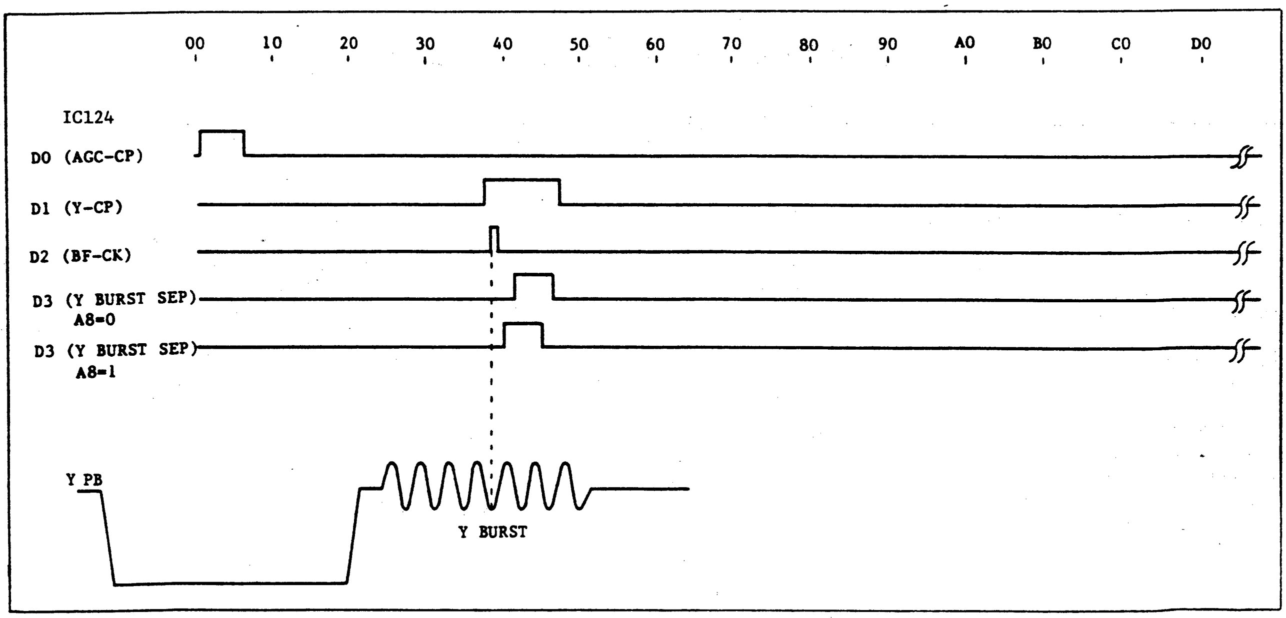


Fig. 9–74 Y Timing Generator (2)

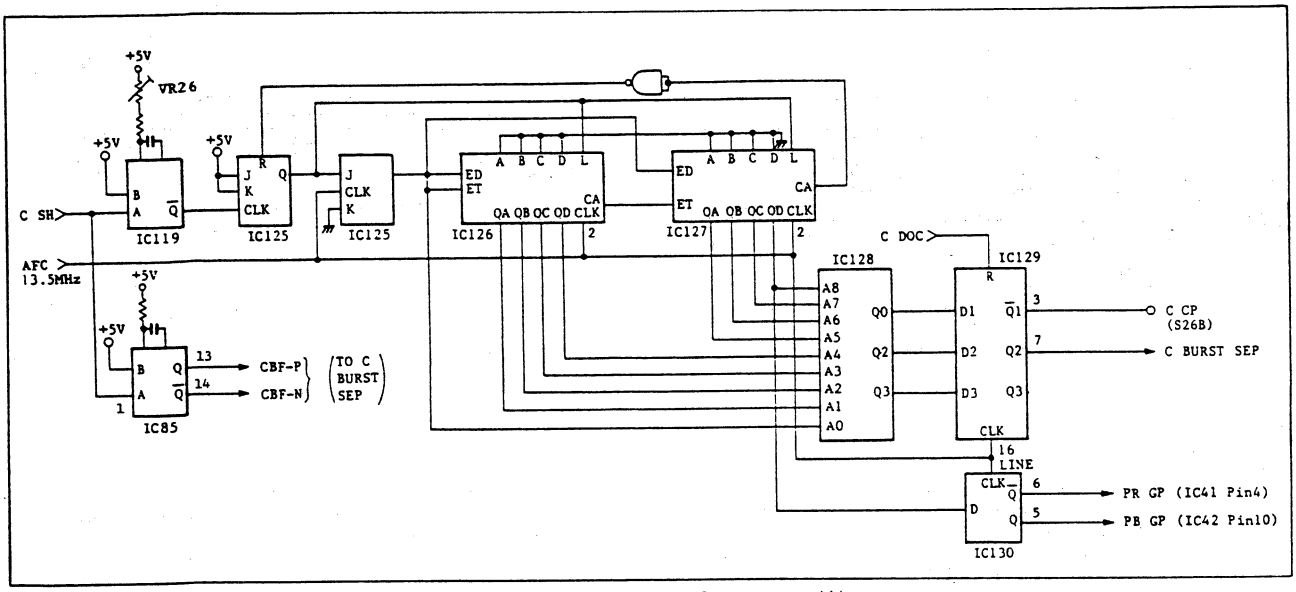


Fig. 9–75 C Timing Generator (1)

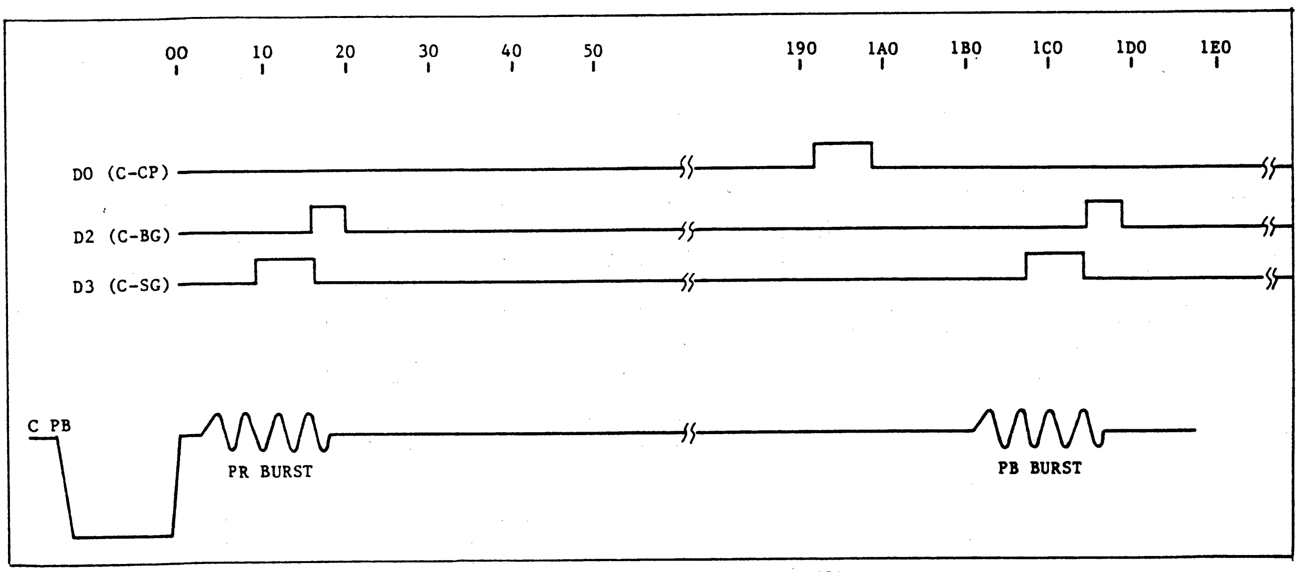


Fig. 9–76 C Timing Generator (2)

9–21. Y/C START GENERATOR CIRCUIT

The fundamental purpose of this circuit is to generate start signals for writing to the TBC's memory. The circuit also produces a pseudo–start signal based on the information of the previous H; by counting clocks from the APC, or search VCO circuits even when H sync and burst are lost due to drop out etc..

When not in the high speed search mode (+/– X8, X32), clock pulses are taken from the APC circuit.

The binary counters (IC132, IC133) start counting with the Y SH signal. The Q output of IC131 enables the counters and after 5 clock cycles, the write signal is generated.

In the high speed search mode, the 13.5MHz clock from the search VCO and the burst timing signal (IC101 pin 12) from the APC circuit are used.

The C kill signal, changes the loading of the binary counters (IC132, IC133). Now, 83 clock pulses are counted, before the write start signal is generated.

IC's 135, 136 and 137 form a circuit for generating pseudo–write start signals. The write start signal is generated after 864 clock pulses. The preset value of this counter is "CA7" in hex (3239). This pseudo–output is masked, by the gate circuit, and is not output when H sync information is input to the clock of IC131.

The C start generator circuit is almost identical, and generates start signals by using the 13.5MHz APC output, and the APC burst gate pulse. However, with C signals, the burst gate signal is generated twice in each 1H period.

Figure 9–77 shows the Y start generator circuit.

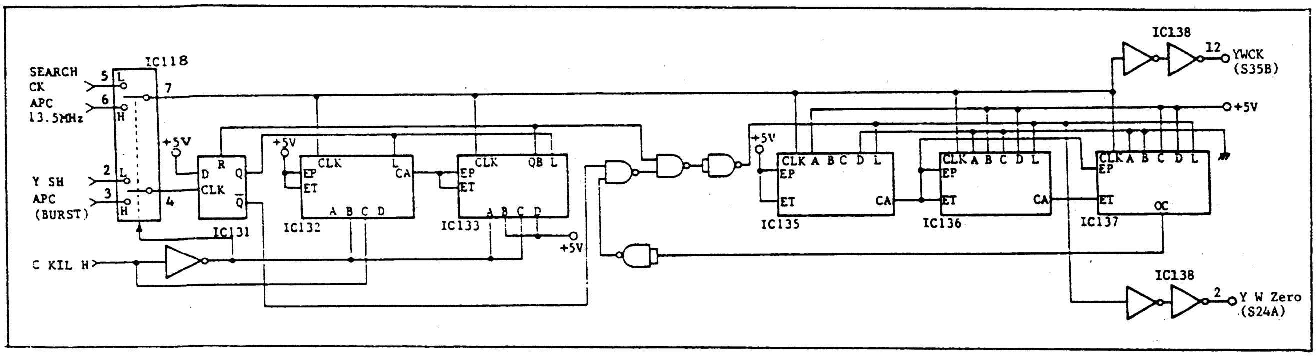


Fig. 9–77 Y Start Generator

Figure 9–78 shows the C start generator circuit. The binary counter of IC139 starts counting when a burst gate pulse is input from the APC circuit. After 4 clock pulses, the write start signal is output. If this burst gate pulse is the Pr burst signal gate pulse, a Pr W ZERO signal is output. If it is a Pb burst signal gate pulse, a memory write signal is sent to TBC–1 as a Pb W ZERO signal.

In the same way as the Y start generator circuit, a pseudo–write start signal can be generated even if the burst gate signal is lost. When generating Pr write start signal, IC's 143, 144 and 145 are preset to "CA7" (hex), and the start pulse is a Pb write start signal, "E54" (hex) is preset into the counters and 432 clock pulses are required to produce the start pulse.

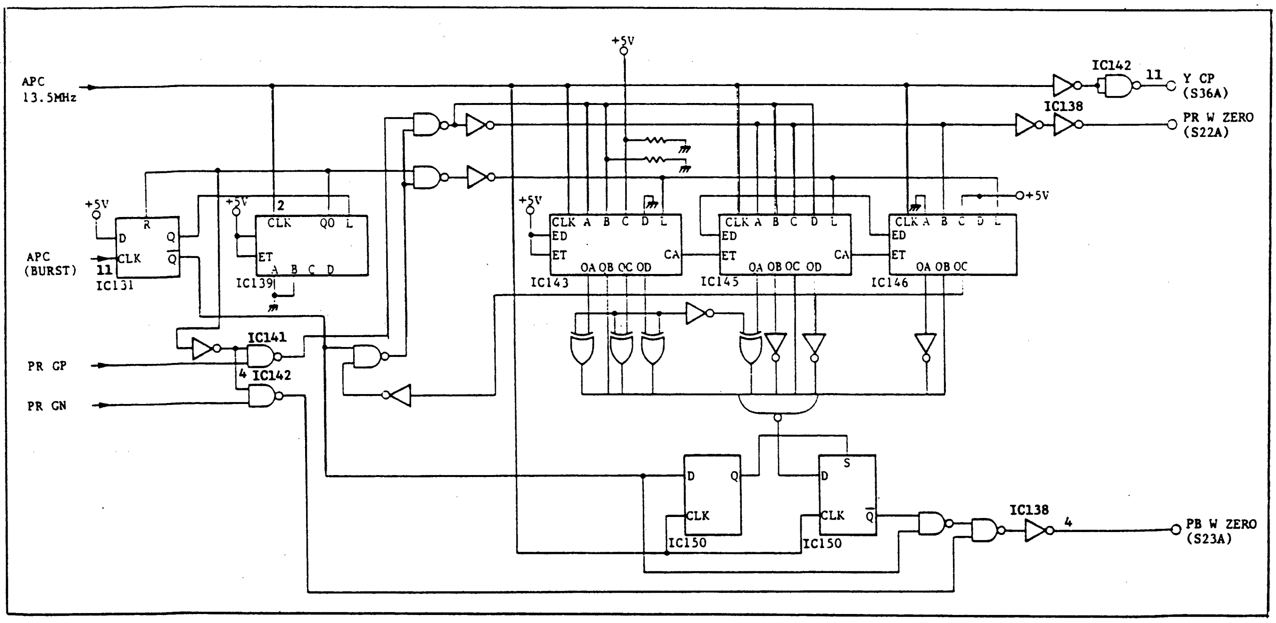


Fig. 9–78 C Start Generator

10 ENCODER

GENERAL DESCRIPITION

This circuit performs the following actions.

1) A/D Conversion
2) D/A Conversion and Encoder
3) VISC Control

10–1. A/D CONVERTER

This circuit converts the analog Y and C signals demodulated in the Y (S4) and C (S3) playback circuit into the 8 bit digital Y and C signals. And these signals are output to the TBC–1 circuit. Refer to Fig 10–1.

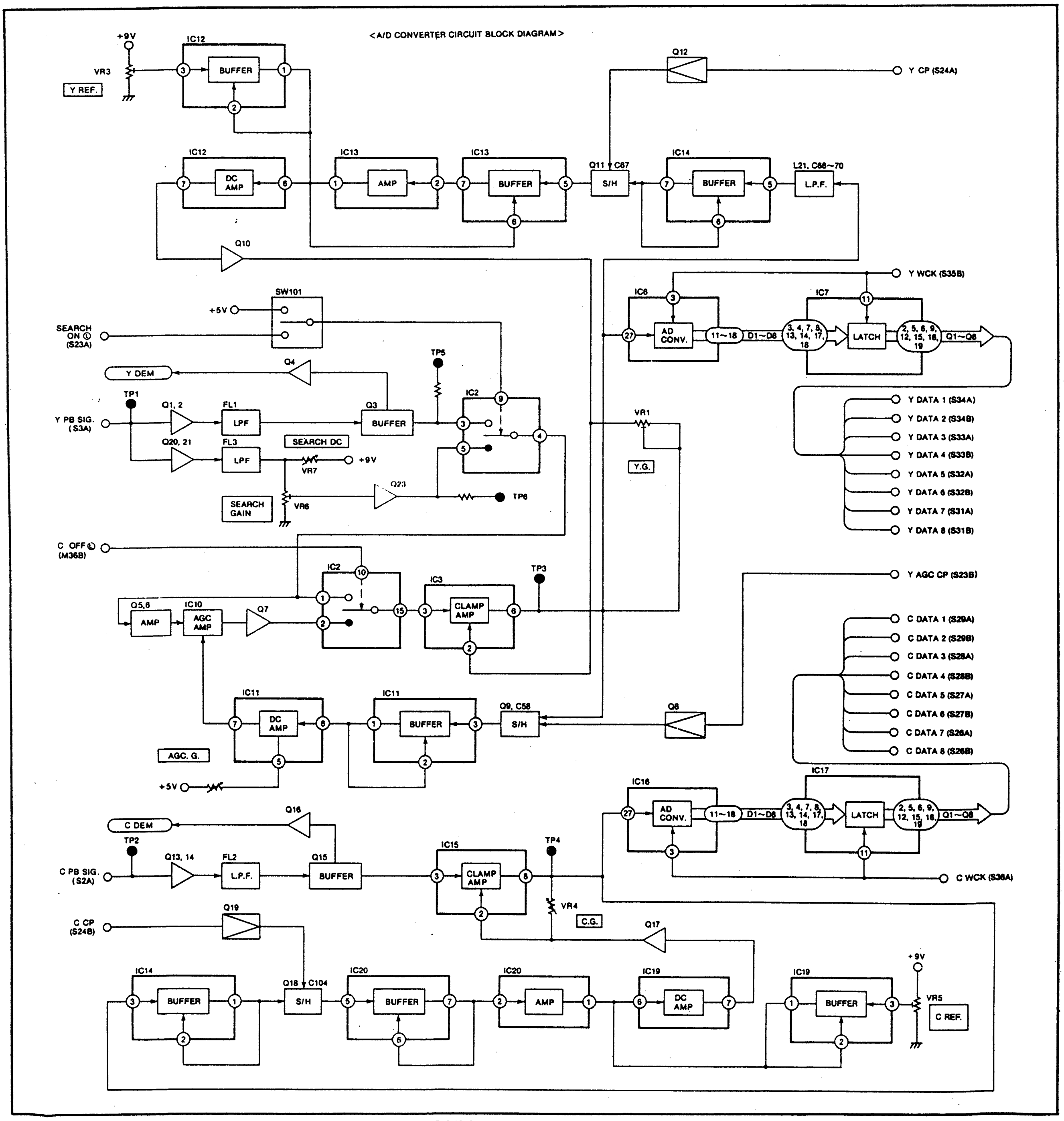


Fig. 10–1 A/D CONVERTER CIRCUIT BLOCK DIAGRAM

10-2. D/A CONVERTER AND ENCODER

This circuit converts the digital Y, Pr and Pb signals locked with the REFERENCE VIDEO signal from the TBC-1 circuit into the analog Y, Pr and Pb signals and produce a composite PAL signal from the Y, Pr and Pb signals SYNC signal used by the encoder are input from the sync generator circuit (TBC-1).

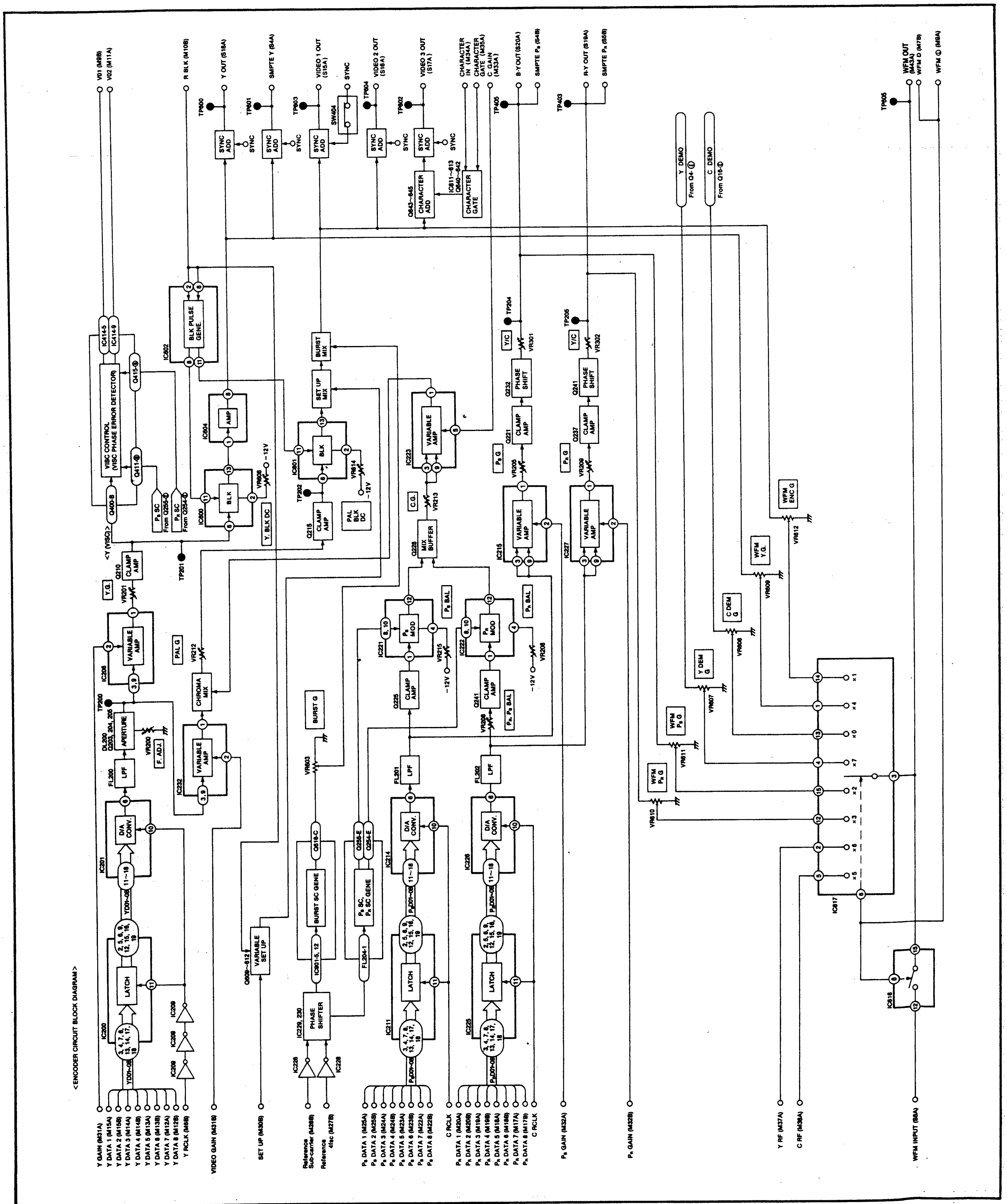


Fig. 10-2 D/A CONVERTER AND ENCODER CIRCUITS BLOCK DIAGRAM

10-3. VISC CONTROL

The purpose of this section is to detect the VISC signal phase, which is inserted in the decoder circuit. The VISC signal is burst phase information. We can use this information, to reduce the subcarrier leakage. The VISC signal is inserted in line 15 by the decoder circuit, and is detected by the encoder circuit. The encoder circuit detects the VISC signal, and shifts the read horizontal drive (RD HD) phase to match the VISC signal.
Figures 10-3 and 10-4 show the principle of how to reduce the subcarrier leakage.
The decoder circuit uses line correlation when separating the Y and C signals, to eliminate the subcarrier leakage on the Y signal, and the delays of the C signal.
Normally, when a composite signal is decoded, all burst phase reference information is lost. If the C signal is modulated by the same phase sub-carrier as the burst signal, sub-carrier leak can be reduced even further. This information is contained in the VISC signal.
The encoder detects the VSC signal, and sends this information (2 bit data and voltage) to the TBC-1 (sync generator section). The TBC then controls the RD HD position to match the VSC signal.

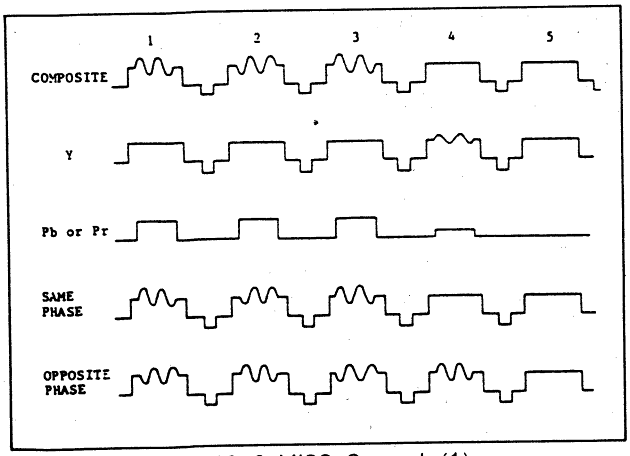


Fig. 10-3 VISC Control (1)

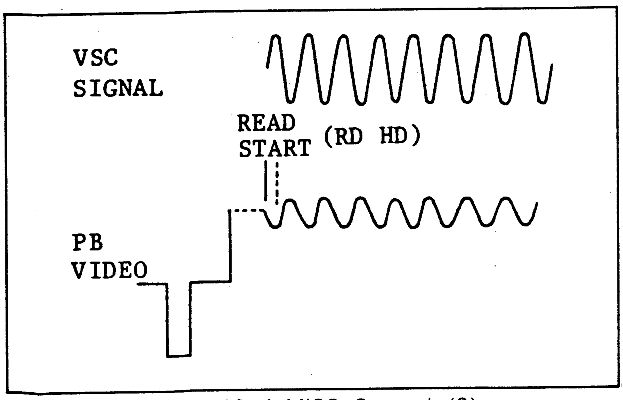


Fig. 10-4 VISC Control (2)

DETAILED DESCRIPITION

10-4 A/D, D/A PROCESS

10-4-1. PRINCIPLE OF A/D, D/A PROCESS

Information contained in analog signal form is directly affected by distortion, noise, time base errors (due to video tape stretching and shrinking) and other form of interference coming from the transmission system and circuits which process the signals. Digitizing a signal converts it to a string of numbers which can then be processed like any other data to remove errors, interference, noise etc. As long as the numbers can be reproduced, the signal can be returned to its original analog form. Figure 10-5 shows the A/D conversion process.

a. Input signal (original signal)
b. The input signal is sampled, and instantaneous values of the analog signal are extracted.
c. Quantization divides the sampled analog signal into a number of steps, dependent on the number of bits produced by the A/D converter.
d. The signal is encoded and converted to digital.

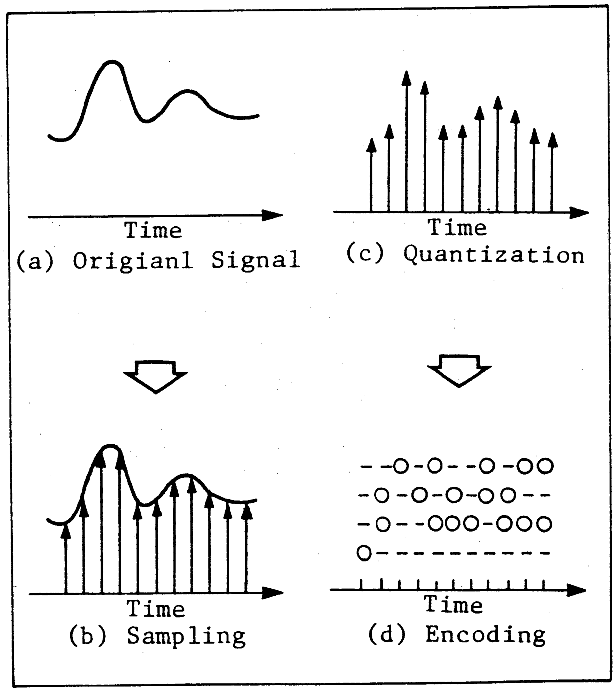


Fig. 10-5 A/D Conversion Process

The A/D conversion process is, as shown in figure 10-5. D/A conversion employs the pooosite principle to convert digitized signals back to analog.

10-4-2. SAMPLING

The sampling concept is shown in figure 10-6..

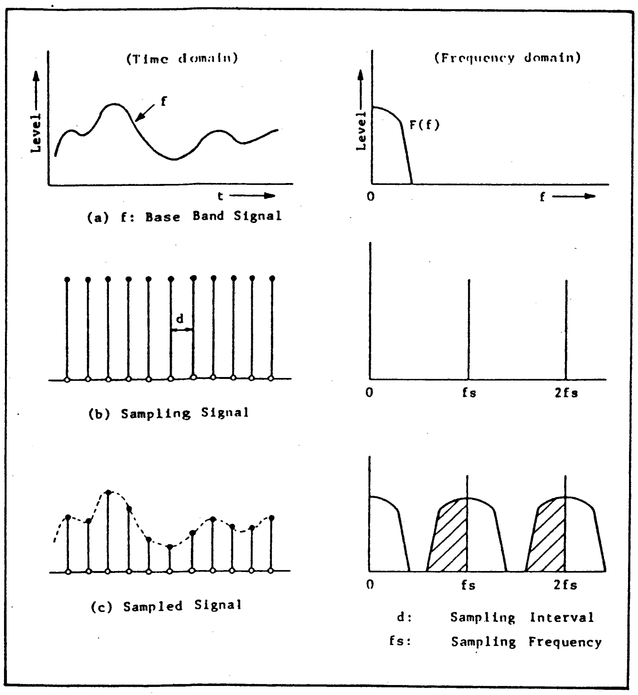


Fig. 10-6 Sampling

Sampling can be reduced to two concepts, time and frequency. In considering time, a fixed frequency is used to sample the base band signal (input signal). When sampling is done, the base band signal is converted into a series of varying amplitude pulses which represent the value of the signal at the sampled points. In considering frequency, the sampling frequency (fs) is set to a frequency two or more times the input signal frequency. The spectrum of the sampled signal contains harmonic components (sidebands) produced by the input signal and the sampling signal. When these harmonic components overlap the base band signal, they are called folded components.
(The shaded area of figure 10-6). As long as folded components do not overlap the input signal, the input signal component can be extracted later during the D/A conversion.

10-4-3. QUANTIZATION

In quantization, the peak levels of a sampled input signal are expressed in binary code.
Refer to Fig. 10-3.

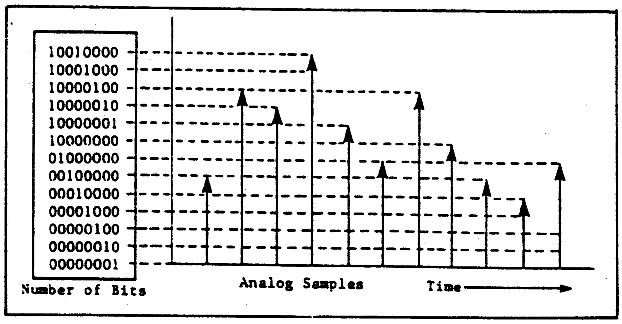


Fig. 10-7 Quantization

A sampled analog signal is divided into a number of steps, dependent on the number of bits used by the A/D converter IC (8 bits = 256 steps). The value of each step is expressed by 0's and 1's. If the number of steps is too small, noise will be created between steps. This between step noise is reduced by increasing the number of bits and steps. This noise is called quantizing noise. When the above processing is performed, A/D conversion is accomplished.

10-4-4. SYSTEM DIAGRAM OF A/D AND D/A CONVERSION

As shown in figure 10-8, a pre-filter and interpolation filter are needed in addition to the A/D and D/A converters. The pre-filter is attached prior to the A/D converter. It is used to limit the input signal frequency to less than one half the sampling clock frequency. This is done to prevent interference from occurring between the base band signal and the sampled signal's sidebands (fold over) which will reduce the S/N ratio of the signal. (See figure 10-6). The interpolation filter prevents the sampling clock and sideband from appearing in the analog output.
In other words, since the digital output signal is composed of discrete levels (steps) occurring at the sampling rate, a filter is required to remove these harmonics and to smooth the stepped waveform back into an analog signal.

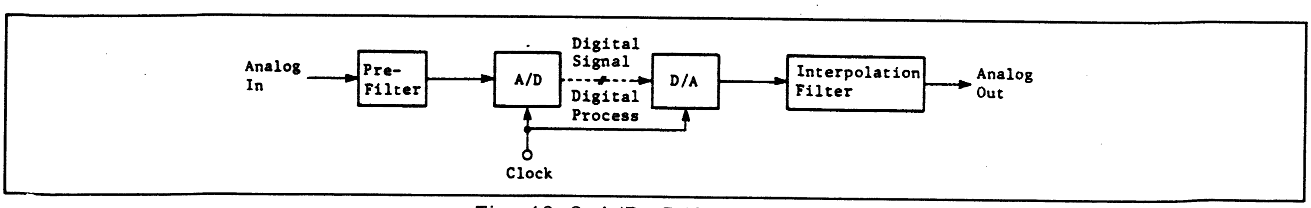


Fig. 10-8 A/D, D/A Process

10–5. DETAILED DESCRIPITION OF A/D CONVERTER CIRCUIT

10–5–1. LPF

The Y signal passes through a 5MHz LPF first, in order to limit the maximum frequency to less than half the sampling frequency (13.5MHz). This will improve the overall S/N ratio by preventing beats from occurring between the playback signal and the sampled signal's sidebands (fold over distortion).

Figure 10–9 shows the frequency spectrum

The Y signal, which is band limited by this 5.0MHz LPF is divided into two parts. One goes to the AGC circuit, while the other goes to the clamp circuit. This selection is made by AGC ON (L) from TBC–2. A low level is output in all search modes except the slow mode, using the play head.
This signal enables the AGC to correct fluctuations in the playback level, caused by differences in tape speed. In the play mode, or slow mode using the play head, the 5.0MHz band limited signal is output to the clamp circuit. Figure 10–11 shows the A/D converter circuit.

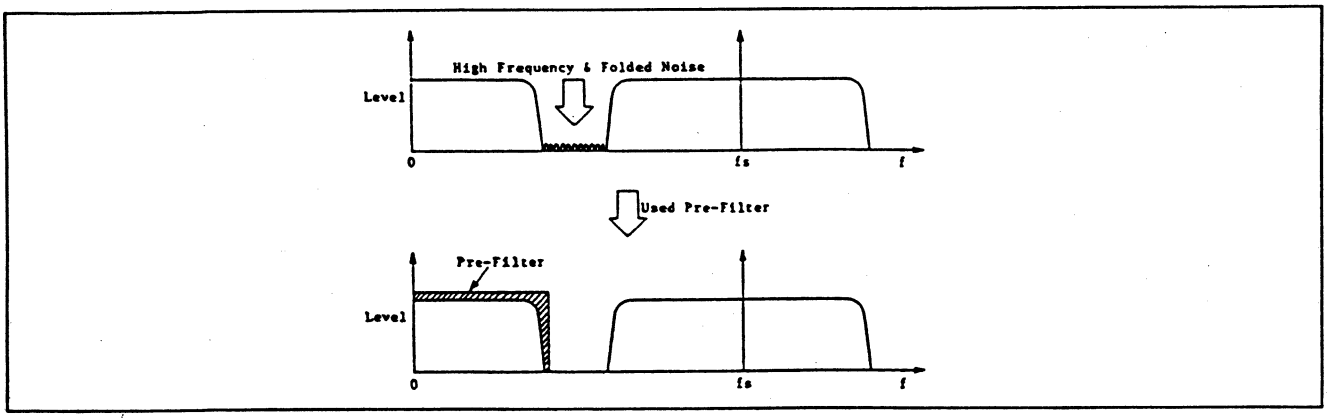


Fig. 10–9 Frequency Spectrum

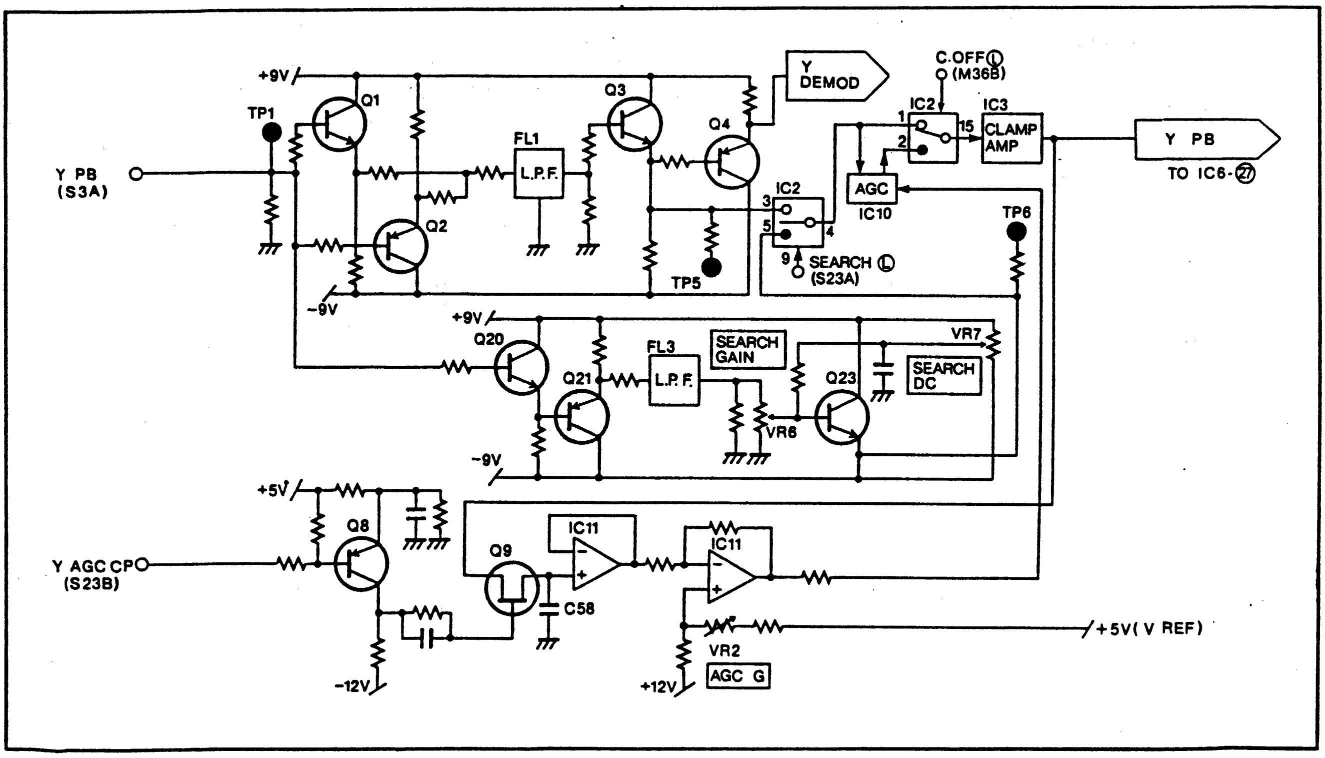


Fig. 10–10 Clamp Amp Circuit

10-5-2. CLAMP AMP CIRCUIT

Refer to Fig. 10-10 Clamp Amp Circuit.
This circuit is extremely important. If the clamp level were allowed to vary, subsequent A/D conversion output values would also change. Signals which have passed through the 5.0MHz filter, decay by about 6dB and therefore are amplified by about 8dB by IC3.
First the DC level of the pedestal is sampled by Q11, using the Y CP applied through Q12. This DC level is then input to pin 5 of IC13 (op amp). The output of this op amp is fed back to the another input of the op amp. If there is a difference between the two inputs, a fixed DC level output is maintained by amplifying the level difference. IC12 sets the clamp level, via VR3.
It is then passed through the second half of IC12 and Q10, before being input to pin 15 of IC3. The numerical value obtained from the pedestal level during A/D conversion is fixed by the DC level output from this circuit.
The Y signals, clamped as described above, are converted by an 8-bit (256 step) converter IC. Figure 10-11 shows the A/D conversion circuit.

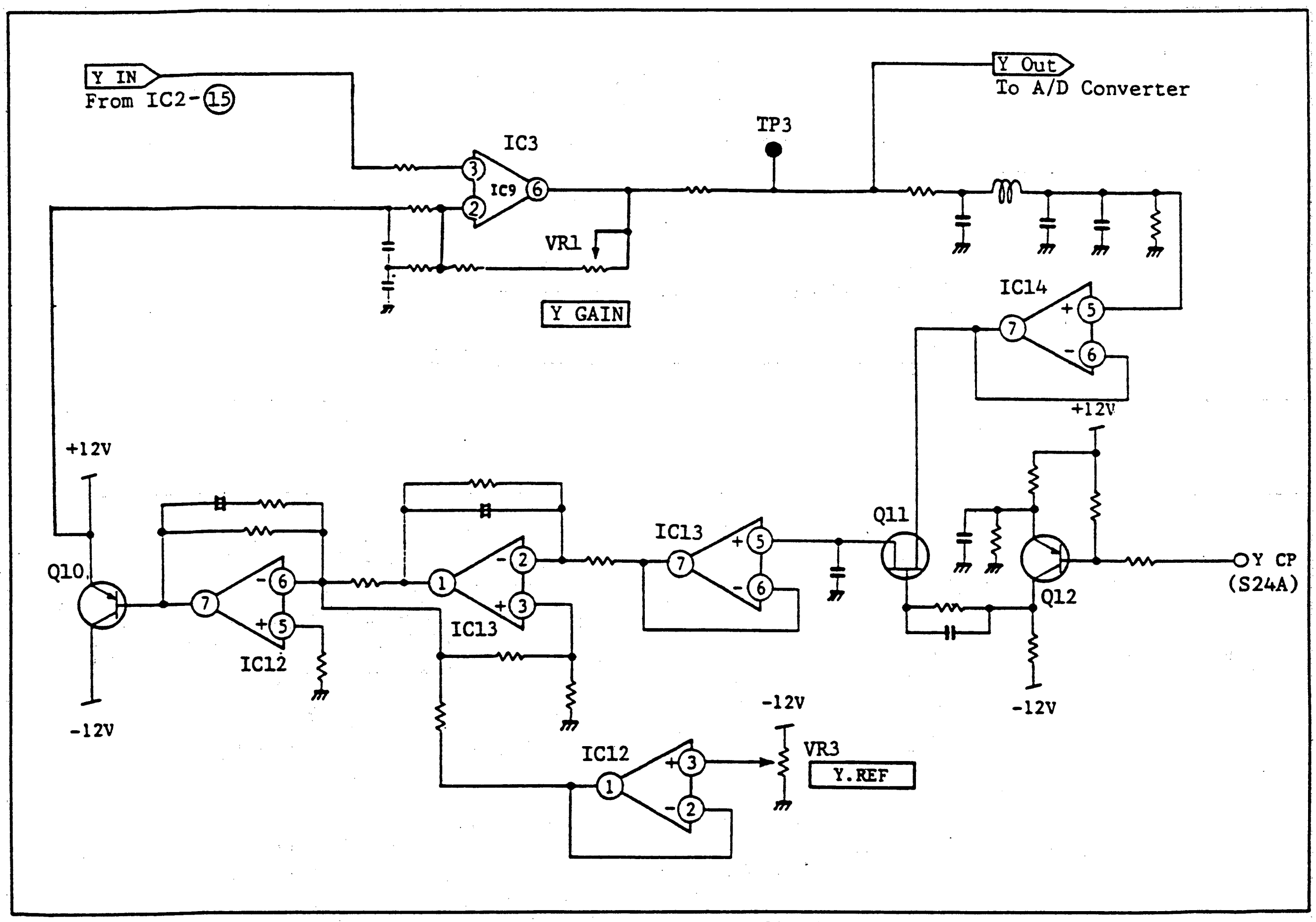


Fig. 10-11 A/D Converter Circuit

10-5-3. A/D CONVERTER CIRCUIT

Refer to Fig. 10-11 A/D Converter Circuit.
The Y signal, for which the pedestal has been clamped to -2V (DC), is input to pins 39 of IC1.
A/D conversion is performed by IC1, using a 13.5MHz Y WCK, synchronized to time base changes of the Y signal. This clock is output from TBC-2.
As for the dynamic range, during A/D conversion, the pedestal level is set at step 128, and a 115 IRE video level is set at step 256.
The signal output from IC1 is ECL level, and therefore is converted to TTL level at IC17 for proper interfacing with the memory.
Figure 10-12 shows A/D conversion bit allocation and output signals. The sync signal is not converted in the A/D process.

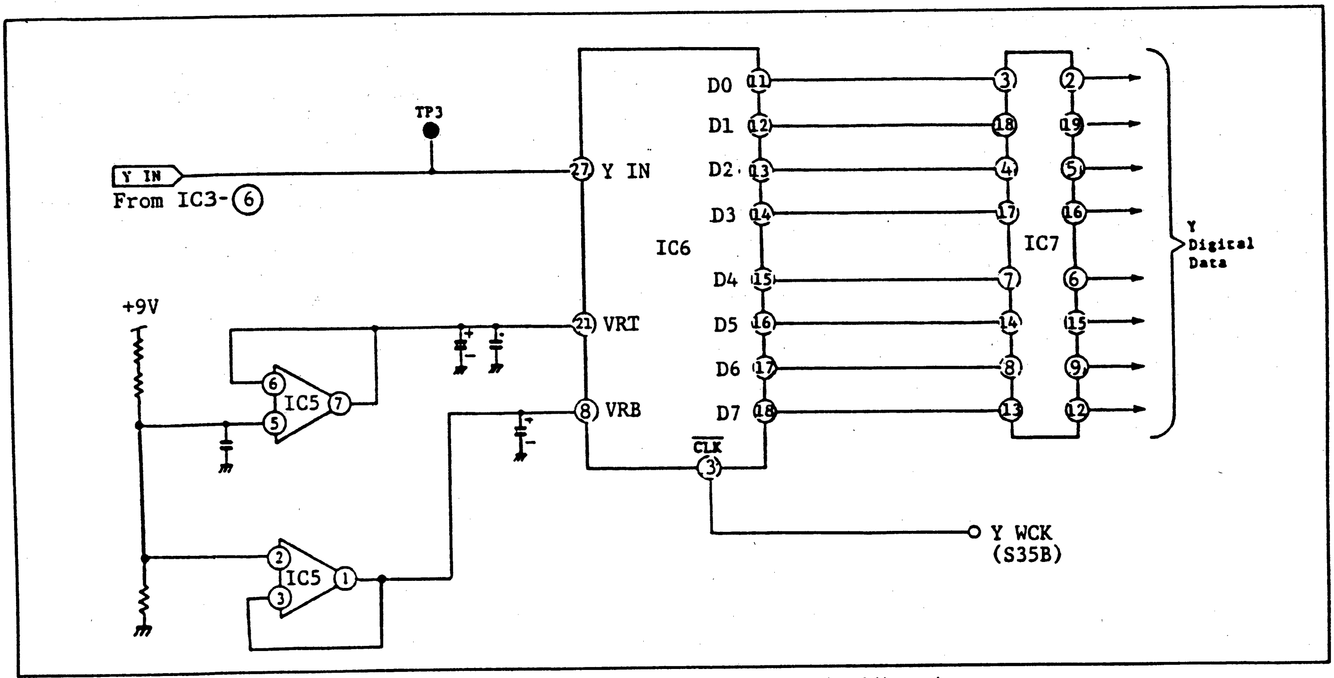
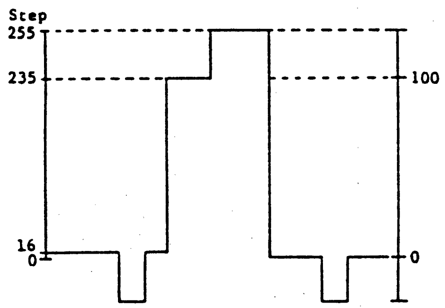


Fig. 10–12 Y Signal A/D Conversion Bit Allocation



L ←							→ M
D8	D7	D6	D5	D4	D3	D2	D1
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0
1	1	0	0	0	0	0	0
			⋮				
0	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1

Fig. 10–13 A/D Conversion Bit Allocation

C signals are band limited with the same 5.0MHz LPF, as used for the Y signals, and output to the clamp amp. This LPF has a bandwidth wide enough for the C signals, and is the same filter as that used for the Y signals. This is done to prevent Y/C signal delay problems, which might occur if two different filters were used.

Just as with the Y signals, the pedestal DC potential for the C signals is fixed by the clamp amp. The C CP signal output from TBC–2 is used as the clamp pulse. Clamping is done at the center line point of the Pr and Pb signals. C signals clamped in this way are A/D converted using an 8–bit (256 level) converter. The C Signal pedestal level is set to the 128th step (center value) of the A/D converter. The C WCK (about 13.5MHz) from TBC–2 is used as the conversion sampling clock, and this is synchronized, just as with the Y signals, to the jitter of the C signal. Figure 10–13 shows the A/D conversion bit allocation.

The A/D converted 8–bit data signals are now written to the TBC–1 memory.

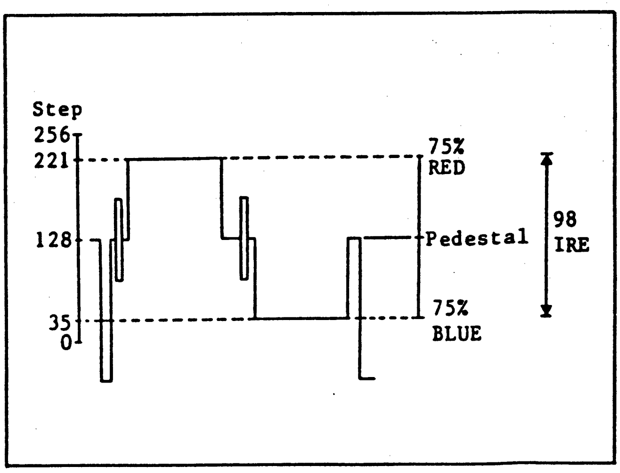


Fig. 10–14 D/A Conversion Block Diagram

10–6. DETAILED DESCRIPITION OF D/A CONVERTER AND ENCODER CIRCUITS

10–6–1. OUTLINE

Refer to Fig. 10–2.
This circuit is used to produce a composite NTSC signal from the Y, Pr and Pb signals. The component video signal is also output from this circuit. Sync and other signals used by the encoder are input from the sync generator circuit (TBC–1).
The circuit performs D/A conversion of the Pr and Pb signals, which are then modulated with the 3.58MHz SC, forming the chroma signal. Quadrature 3.58MHz (separated by 90 degrees phase intervals) are generated from the 3.58MHz signal. The 0 degree phase SC is used as a burst signal. The other phases are used as SC for Pr and Pb modulation.
The burst signal is produced by gating the 0 degree phase subcarrier signal with the BPF, from the sync generator. It is then formed into a sine wave by a BPF. Two phases of SC, those corresponding to the B–Y and R–Y axis, for the burst signal, are needed for 3.58MHz modulation. Pr modulation is done with the SC delayed by 90 degrees from the burst signal, while Pb modulation is done with the SC delayed by 90 degrees from the SC used for Pr modulation. These two SC's modulate Pr and Pb, and create the chroma signal. This chroma signal is gain controlled with a variable amplifier (vari amp) and then mixed with the Y signal.
The Y signal's high frequency response is reduced during the A/D and D/A process, correction is done using an aperture circuit (APT). The Y signal is used for the component output, and the composite output. The Y signal for composite output is amplified via a variable amp and mixed with the C supplied form a blanking select circuit.
Blanking, from the blanking select circuit, set–up, from the variable set–up circuit, and composite sync are added to form an NTSC video signal. This signal is supplied to video outputs 1–3 and WFM out.
Time code character signal can be superimposed on video out 3. Component output is created from Pr and Pb signals from the D/A conversion circuit, and a Y signal whose frequency characteristics have been corrected by an aperture circuit. After amplification with the vari amp, the Y signal is blanked in the same way as the composite signal. A composite sync signal from the sync gen (TBC–1) is added, and sent to the buffer amp.
Then the signal is sent to WFM OUT, component 1 and component 2 out. In the same way, Pr and Pb signals are amplified with the vari amp and buffered, sent to WFM OUT, component 1 and component 2 out. Component output is from the 12 pin connector.

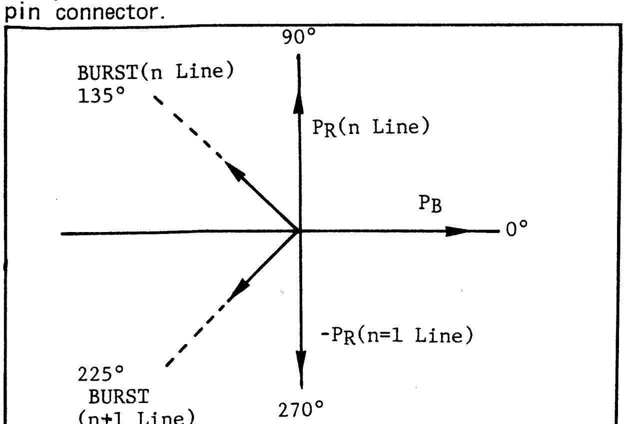


Fig. 10–15 C Signal D/A Conversion Timing Chart

10–6–2. D/A CONVERSION CIRCUIT

This circuit converts time corrected, expanded, digital Y, and Pb and Pr signals, output from TBC1 back to analog signals. This is then output to the encoder circuit. After D/A conversion, Y signal are band width limited by a 5.0MHz LPF. The C signal uses Pb and Pr signals output from TBC1. Chroma noise cancellation (CNC) ON/OFF switching is possible for these signals using SW7. After D/A conversion and bandwidth limiting by a 2.0MHz LPF, these two signals are each divided, one for component and one for composite. Figure 10–14 shows the D/A conversion block diagram. Figure 10–15 shows the C signal D/A conversion timing.

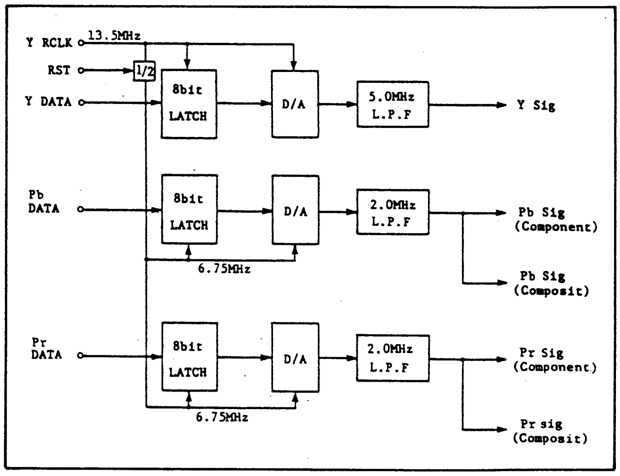


Fig. 10–16 APT Frequency Characteristics

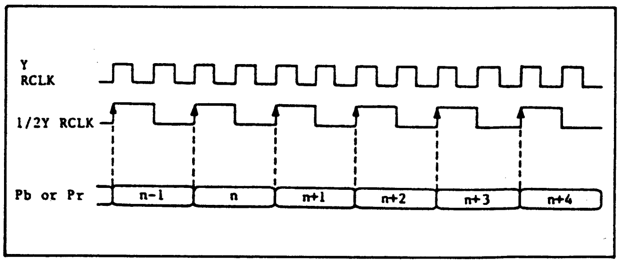


Fig. 10–17 APT Circuit

10–6–3. APERTURE CIRCUIT (COSINE CORRECTOR)

This circuit is used to compensate for high frequency roll off that occurs during A/D and D/A conversion. Q203 and Q204 form a differential amplifier. The signals is buffered, and input to Q204. Delayed 60 nsec by DL200, and input to Q203. The two signals cancel, except for those frequencies in the range of 8MHz, that are shifted enough by the 60 usec delay line (DL200) to be 180 degrees out of phase. For this reason, they do not cancel, and their frequency response characteristics are like that shown in figure 10–16. Adjustment of these frequency characteristics is done with the mix (VR200) balance control and are variable by about 3dB at 8MHz.

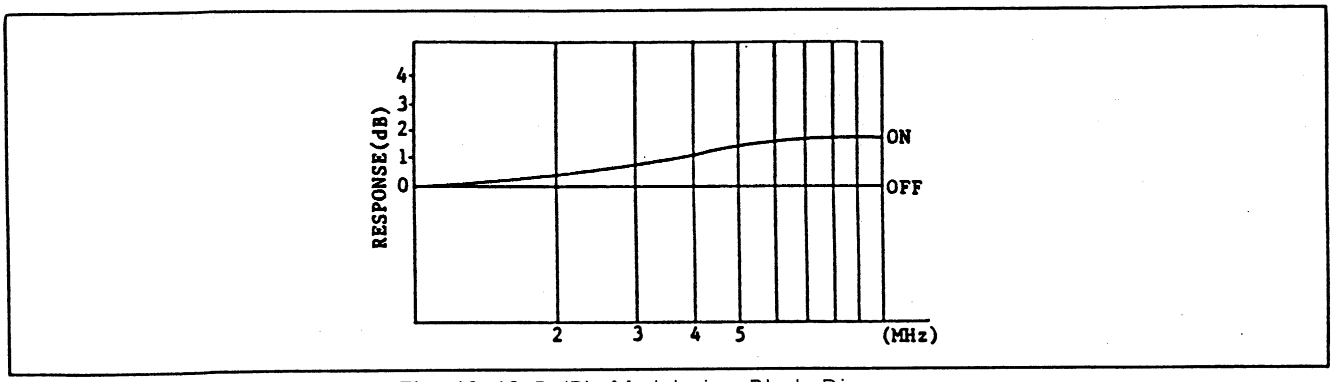


Fig. 10–18 Pr/Pb Modulation Block Diagram

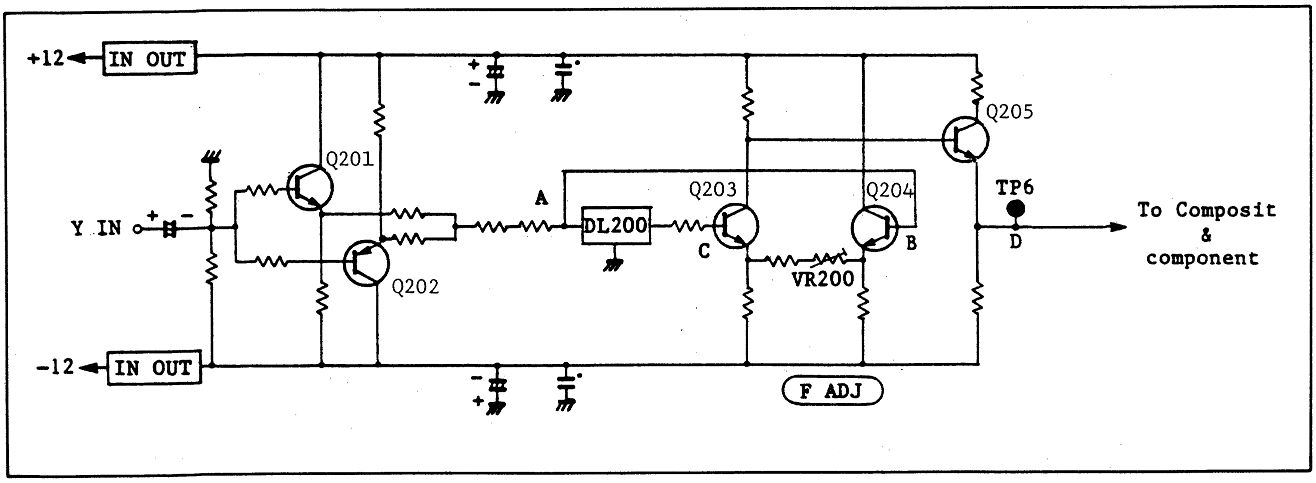


Fig. 10–19 Sub–Carrier Phase

10–6–4. Pr/Pb MODULATION

Refer to the block diagram on in figure 10–18. 4.43MHz frequencies having 90 degrees phase differences, created by a phase shifter are used for Pr and Pb modulation.
The 4.43MHz CW, delayed from the burst signal by 90 degrees, is used for Pr modulation. The 4.43 MHz CW, delayed by 180 degrees, is used for Pb modulation.

D/A converted Pr and Pb signals are balance modulated via IC221 (Pb) and IC222 (Pr). The modulated Pr and Pb signals are mixed with Q229 and form the chroma signal. The C signal is mixed with the Y signal and PAL composite signal. This NTSC composite signal's level can be set with the level adjustment, with a range of +/– 3dB.

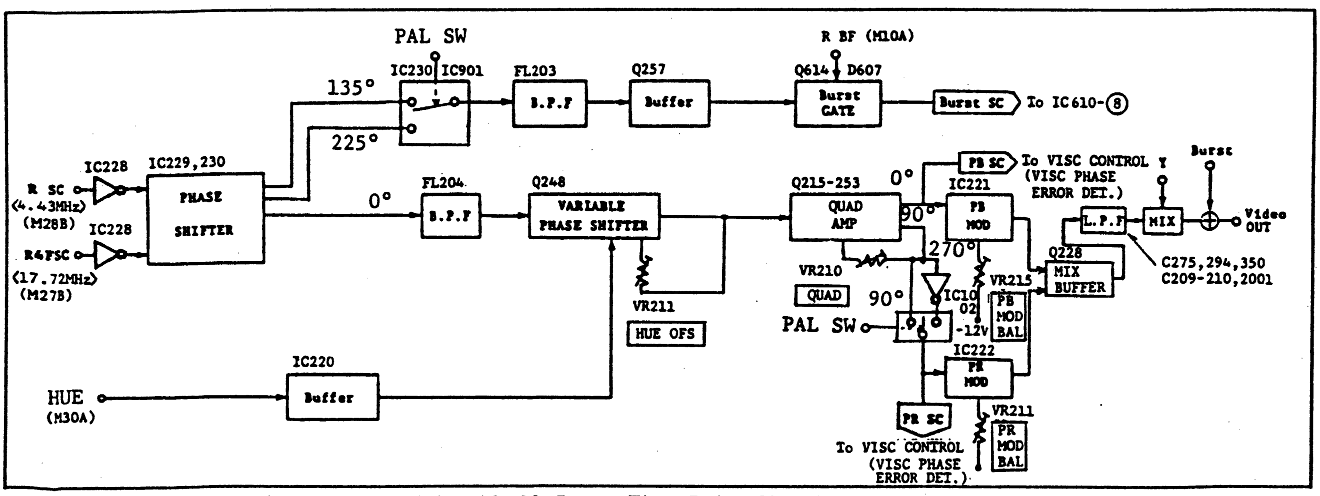


Fig. 10–20 Burst Flag Pulse Signal Flow

10-6-5. BURST FLAG GATE AND MIXING CIRCUIT

The 0 degree phase 4.43MHz is the burst SC. This burst signal is gated by the burst flag pulse, from the sync generator, and becomes the burst signal. The burst Flag pulse is only used for the B-Y axis.

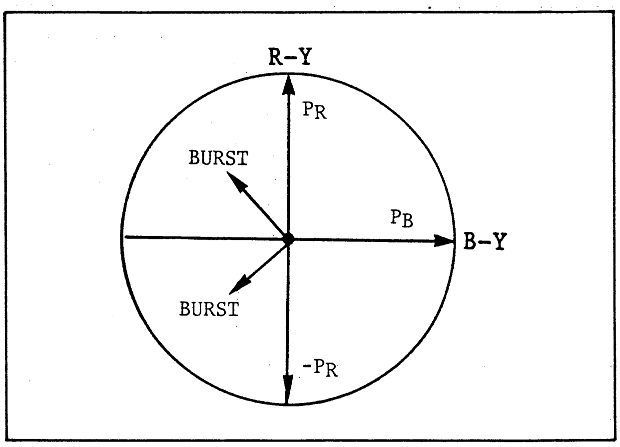


Fig. 10-21 Burst Signal Vector Summing

10-6-6. Y/C MIX

The Y signal output from VARIABLE AMP (IC232-1) and the C signal output from VARIABLE AMP (IC223-1) are mixed and supplied to the clamp circuit.

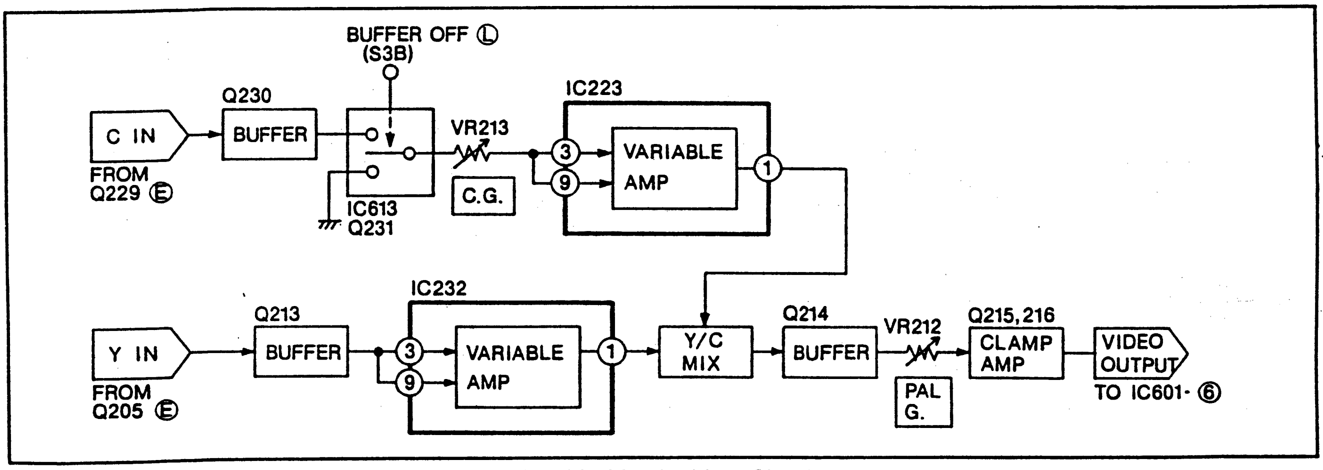


Fig. 10-22 Blanking Circuit

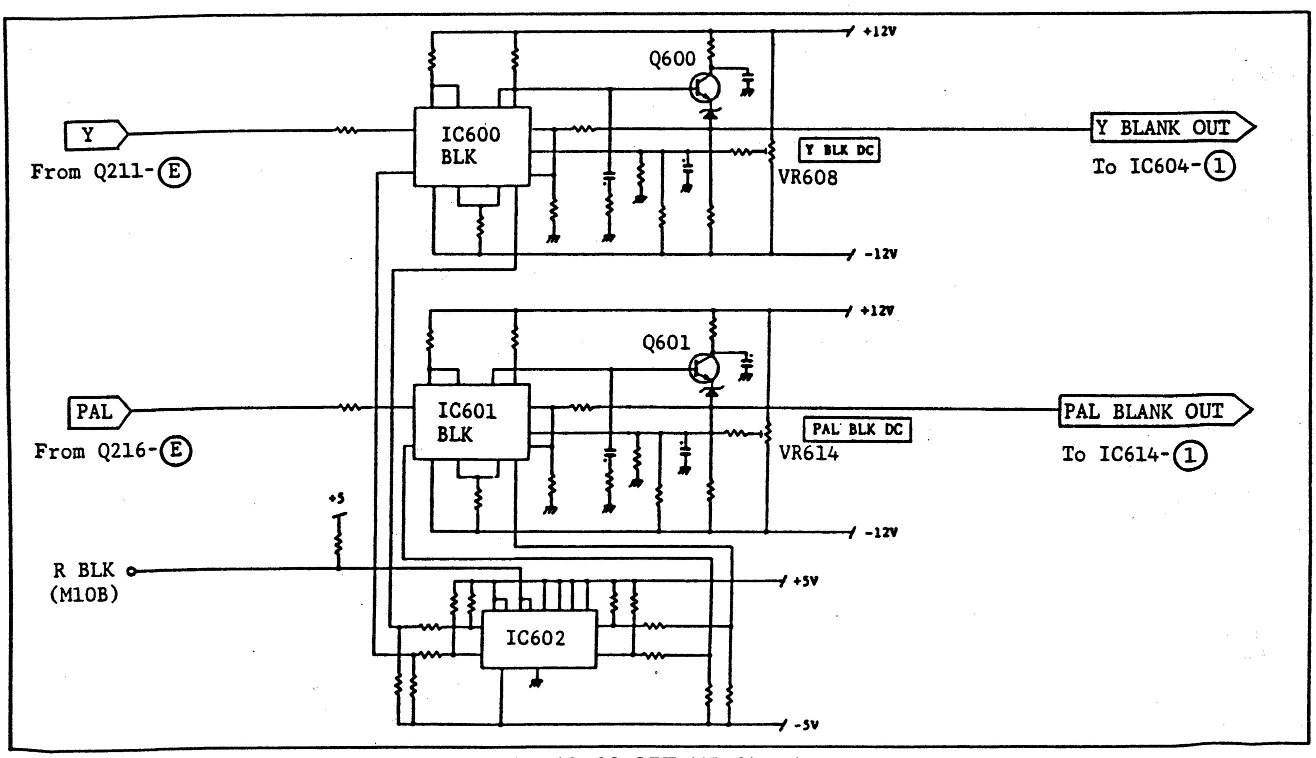


Fig. 10-23 SET UP Signal

10-6-7. BLANKING CIRCUIT

This circuit adds horizontal and vertical blanking to the video signal. The Y component and PAL signal are input, to pin(6) of IC600 and IC601 respectively. These ICs form 2-step OP amps, and output the blanking signals as switched by IC602. Adjustment of the Y signal and PAL signal blanking level is done with VR608 and VR614. Figure 10-22 shows the blanking circuit.

10-6-8. SET-UP CIRCUIT

This circuit adds a set-up to the composite video signal. First the reference signal, from the SYNC GEN, is inverted by IC225. The positive and negative blanking signals are output from IC612 and IC606 respectively as shown in figure 10-23.

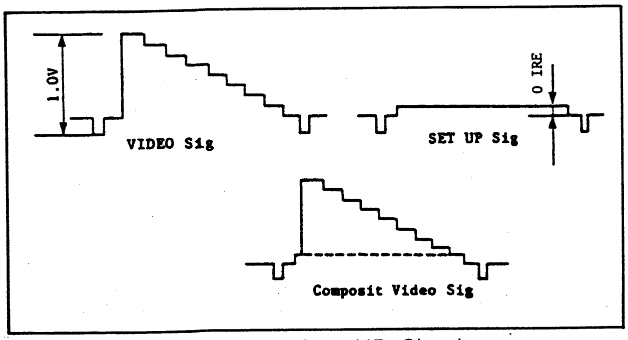


Fig. 10-24 SET UP Circuit

The blanking signal level is set to 0.7V by diodes D604 and D605. This is then added to the PAL composite signal. Set-up level can be adjusted by means of the set-up control in the pull-out drawer, on the front panel. Set-up has a range of −10 IRE, +20IRE. The set-up circuit is shown in figure 10-24.

10-6-9. TIME CODE SUPERIMPOSE CIRCUIT

On screen character information, from the TCG & TCR circuit, can be superimposed on video output 3. The TCG & TCR circuit is shown in figure 10-25.

A window is opened, in the active video, by the character gate pulse. This is done through IC612, IC613 and Q641 and Q642.

The relative timing relationship is shown in figure 10-26. The time code character are added through IC611, IC612, IC613 and Q640. The character brightness level is adjustable by VR604.

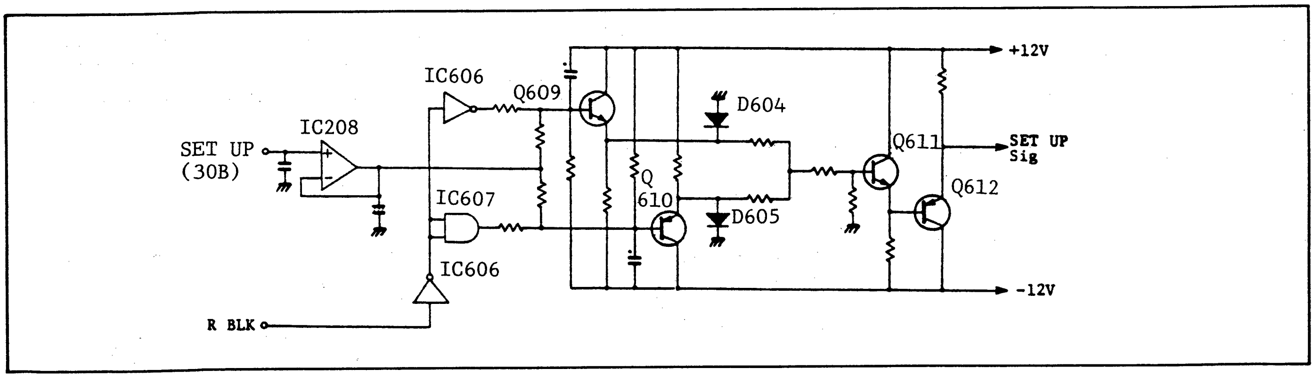


Fig. 10-25 TCG & TCR Circuit

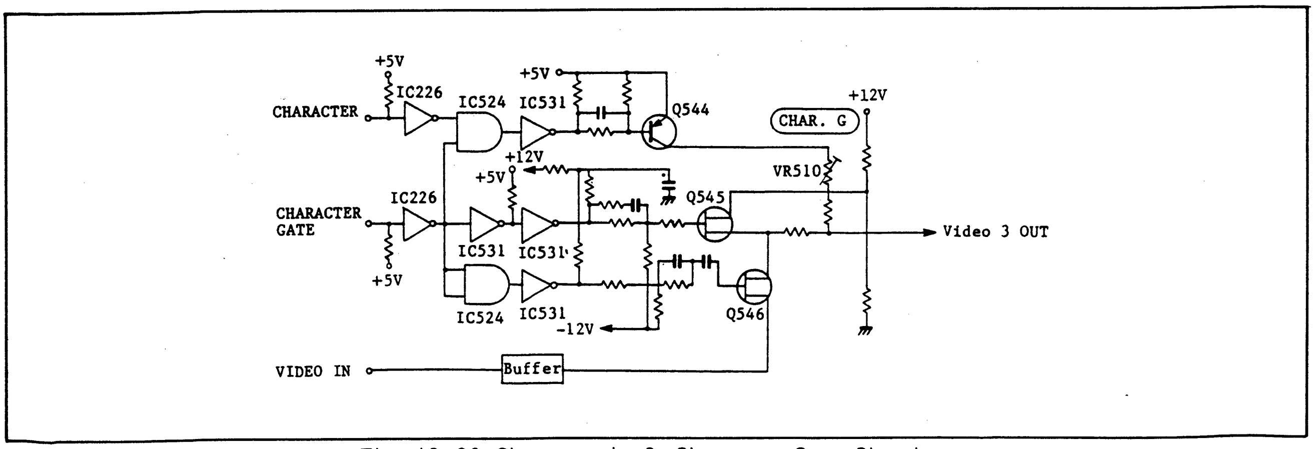


Fig. 10-26 Character in & Character Gate Signal

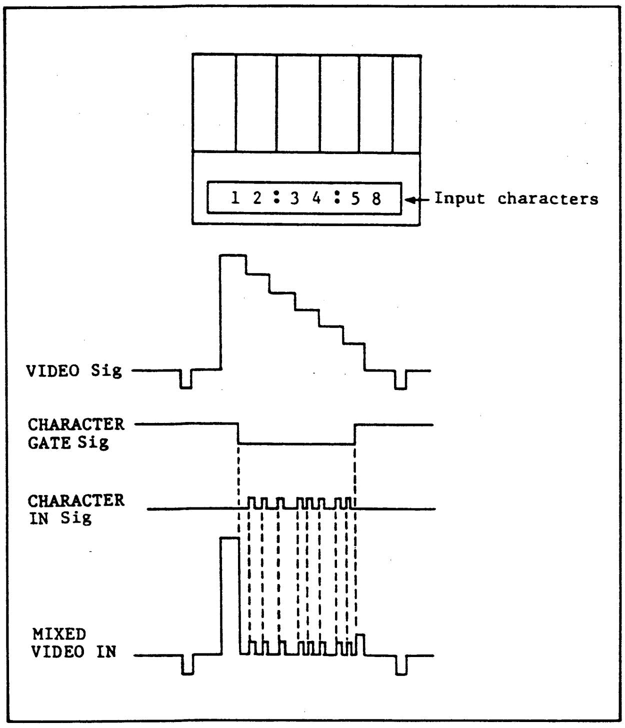


Fig. 10–27 Carrier Leakage Cancel

10–7. DETAILED DESCRIPITION OF VISC CONTROL CIRCUIT

The VISC control circuit is used to minimize the sub–carrier leakage.
Refer to Fig. 10–27. Y and C signals are divided by a comb filter, and carrier leakage may be occurred at this time. When the Y and C signals are mixed, Y leakage and C leakage are canceled, if Y and C leakage are same level and phase.
VISC control circuit adjusts the carrier leakage phase. Refer to Fig. 10–28. The VISC control circuit detects the phase error between the reference sub–carrier and VISC, and this error data is sent to TBC circuit. The TBC circuit moves the Y video signal depend on the VISC phase error data. For example, VISC phase is delay, delay data is sent to TBC and video signal is advanced.
The VISC phase error is detected by two circuits, one is a digital VISC control circuit for coarse control and the other is an analogue VISC control circuit for fine control.

The VISC section consists of 3 main sections.

1. VISC separator and phase control.
2. Digital VISC control circuit.
3. Analog VISC control circuit.

10–7–1. VISC SEPARATOR AND PHASE CONTROL

This section performs VISC separation and phase control. The input video signal enters the band–pass amplifier circuit (Q400, C403 and L426), where 4.43MHz components are amplified. Then the signal is separated into two paths; one is sent to the phase control circuit, while the other is sent to the VISC detection circuit. The phase control circuit performs phase adjustments, matching the VISC signal with burst phase. The VISC detector circuit detects the "line VISC" and enables the digital and analog VISC control circuits.

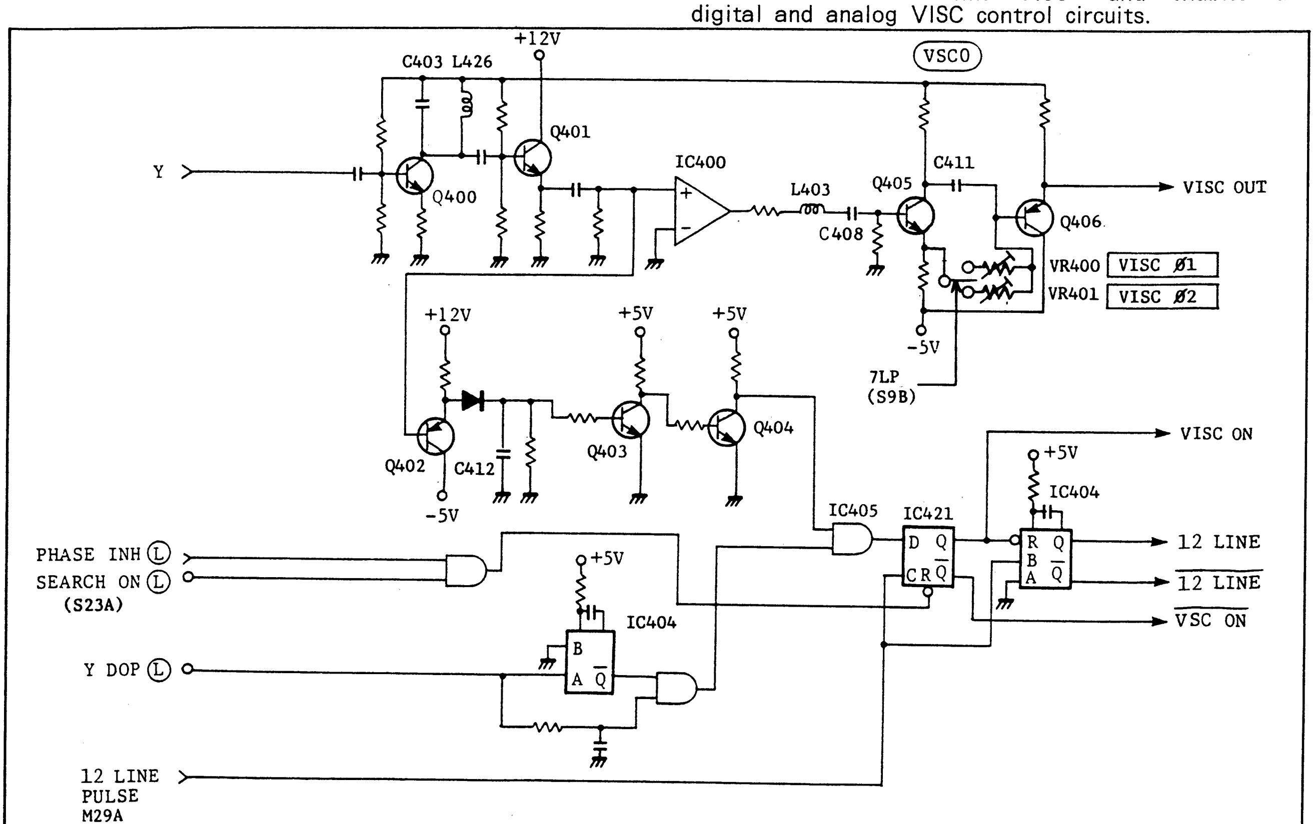


Fig. 10–28 VISC and Sub–carrier Phase

10-7-2. DIGITAL VISC CONTROL CIRCUIT

This circuit detects the VISC phase and sends 2 bit control data to the TBC-1 (sync separator) board. The sync generator detects this 2 bit data, and shifts the read start point (RD HD) accordingly, in units of the 13.5MHz clock. Figure 10-30 shows the digital VISC control circuit. The VISC signal is demodulated by the Pr and Pb subcarriers, in IC407. IC441 is the analog switch which discharges the demodulated VISC signal, with each reference burst flag (R BF) signal.
Fig. 10-31 shows the principle of the digital VISC control circuit.
The VISC signal is compared with 3 reference signal A,B and C. The phase is different 120 degree each. 3 zones are made by the 3 reference signal as shown in Fig. 10-31-(A).
When VISC is in the zone 1, it means normal condition and video phase 1 and video phase 2 are 0. When VISC is in the zone 2, it means advance condition and when VISC is in the zone 3, it means delay condition, and video phase becomes as shown in Fig. 10-31-(B).
The zone is made by the reference signal. For example zone 1 is made by reference signal B and C. The zone 1 is AND part of the vertical lines of reference signal B and C as shown in Fig. 10-30-(D).

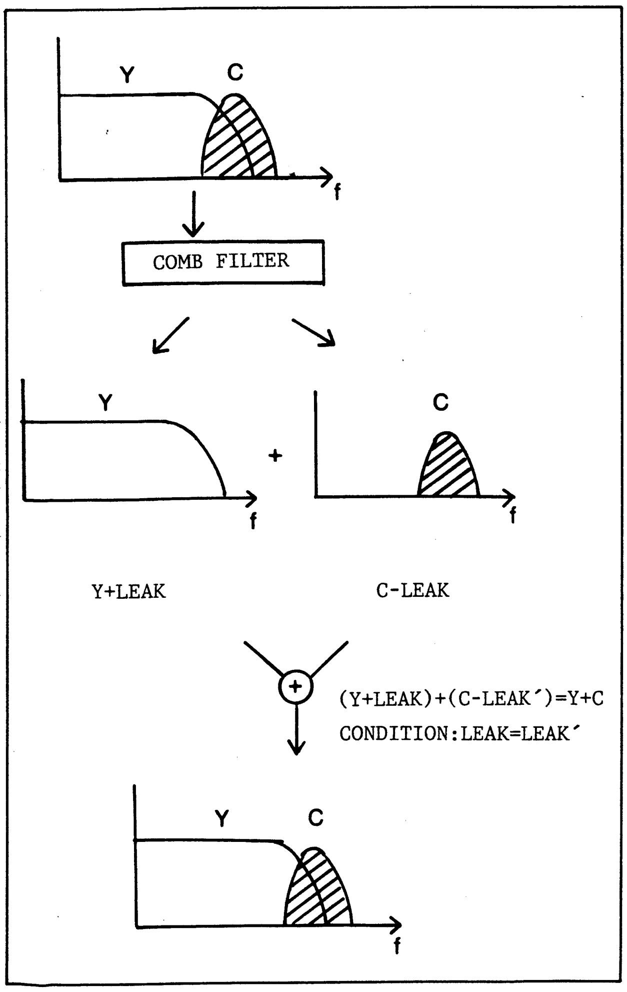


Fig. 10-29 VSC Separator and Phase Control

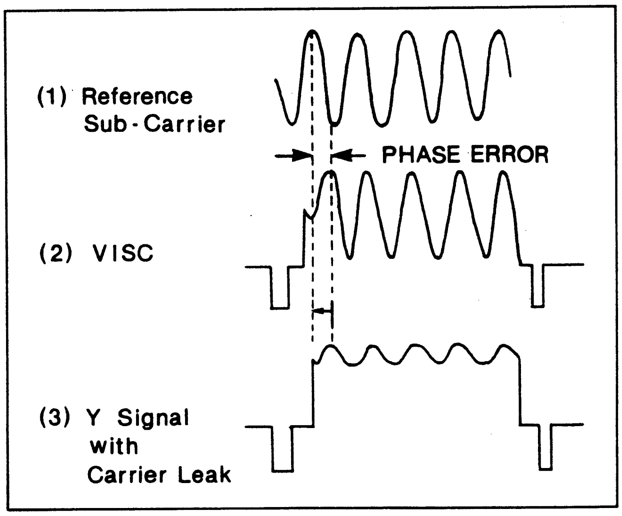


Fig. 10-30 Digital VSC Control Circuit

10-7-3. ANALOG VISC CONTROL CIRCUIT

The analog VISC control circuit performs phase adjustment of the VISC. It has a range of approximately 90 degrees. Please refer to figure 10-32. The new target phase is made by Pr and Pb, and sent to the balanced modulator (IC408). VISC phase and analog target phase are compared, and an error voltage is sent to the sampling circuit. Capacitor C455 is the sampling circuit. This error voltage is sent to a filter amplifier, through the noise filter D404 and D405. IC423 is active when the VISC signal is present on the Y signal. The error voltage is sent to the TBC-1 (sync generator) board.

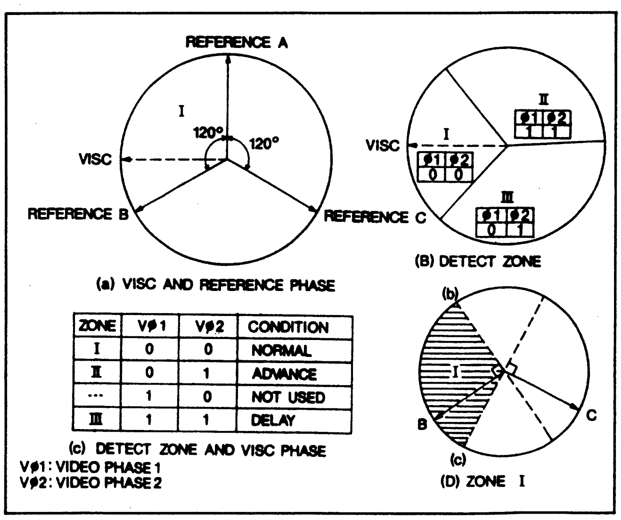


Fig. 10-31 VSC Phase Detect

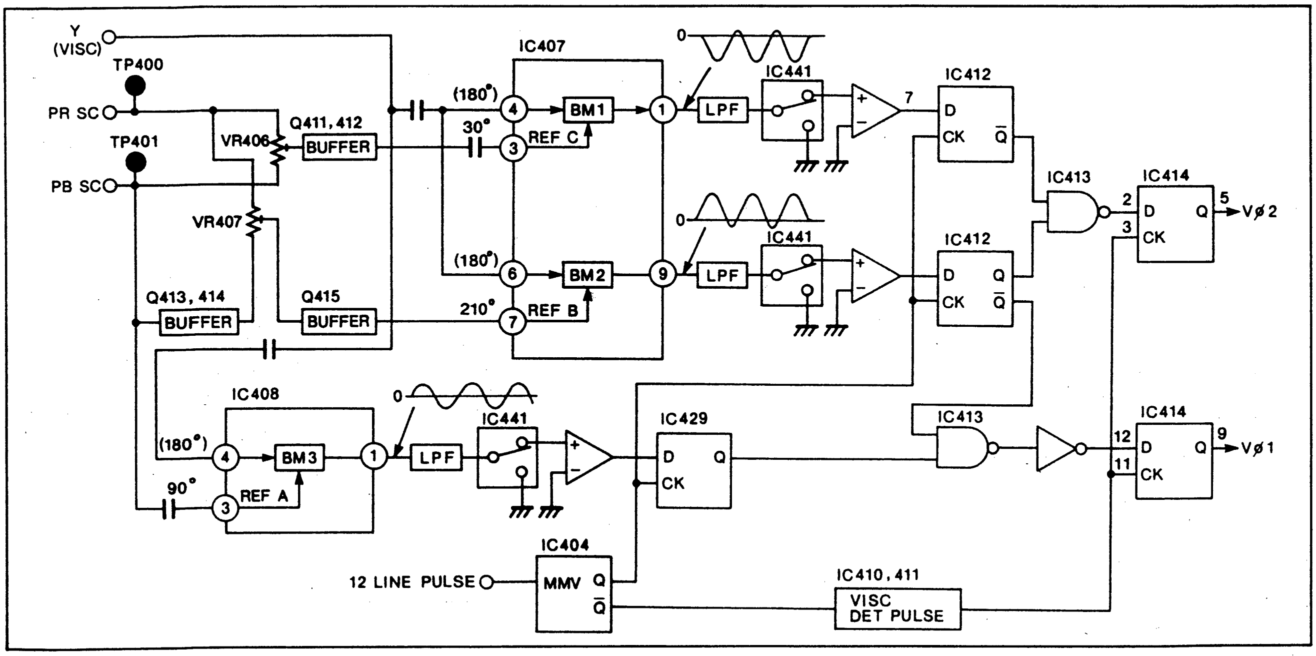
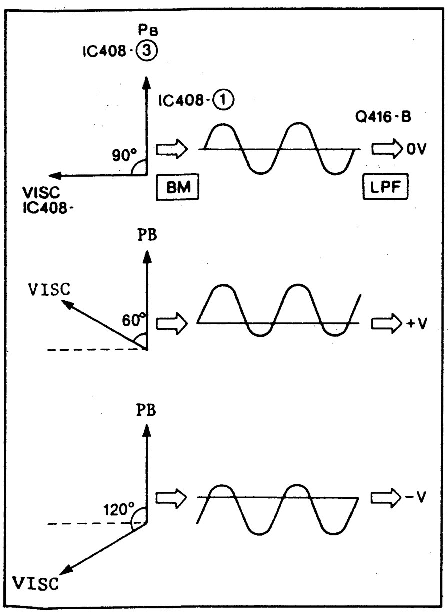
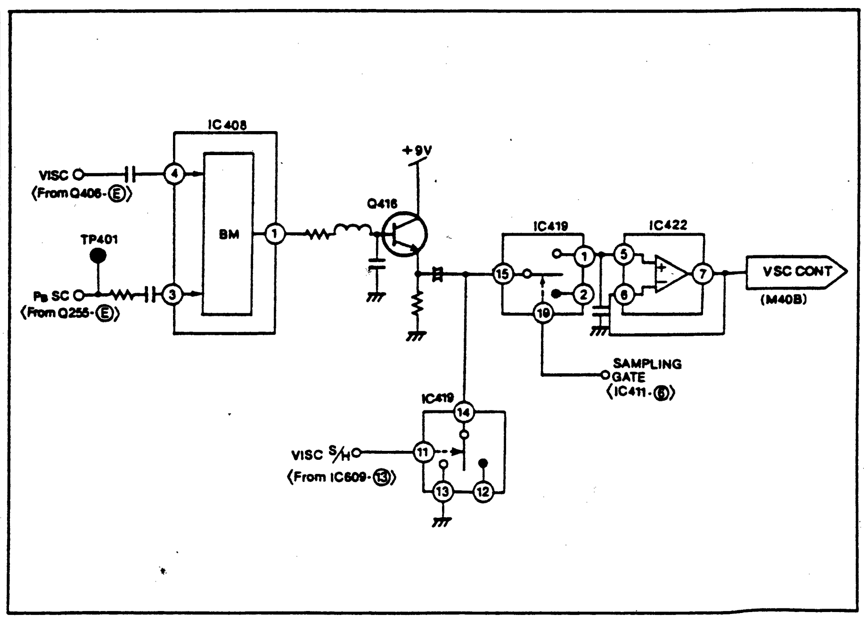


Fig. 10–32 Analog VSC Control Circuit





11. FM AUDIO CIRCUIT (S5)

11–1. GENERAL DESCRIPTION (Overview)

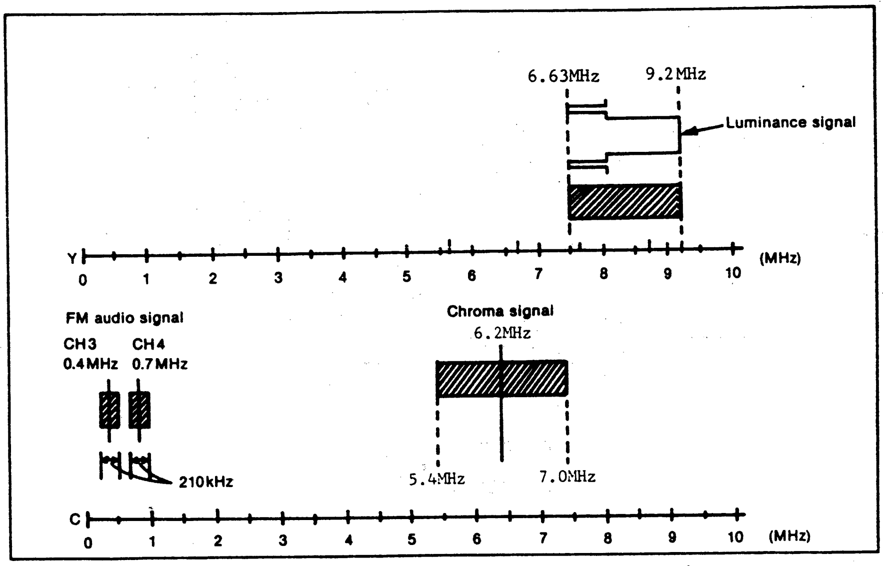


Fig. 11–1 Y.C.FM Audio Frequency Allocation

The FM audio circuit modulates the signals input to channels 3 and 4. It then records them in the chroma signal track together with the chroma signal. During playback, the audio signal is picked up by the chroma heads and undergoes frequency demodulation. Figure 11–1, describes the frequency allocations of the luminance, chroma and FM audio signals.

NOISE REDUCTION SYSTEM

Durling the recording mode, the input signal is logarithmically compressed by a factor of one half.
In the playback mode, the input signal is logarithmically expanded by a factor of two. Refer to figure 11–2.

This system performs two major functions.
1. Widens dynamic range.
2. Improves the S/N ratio.

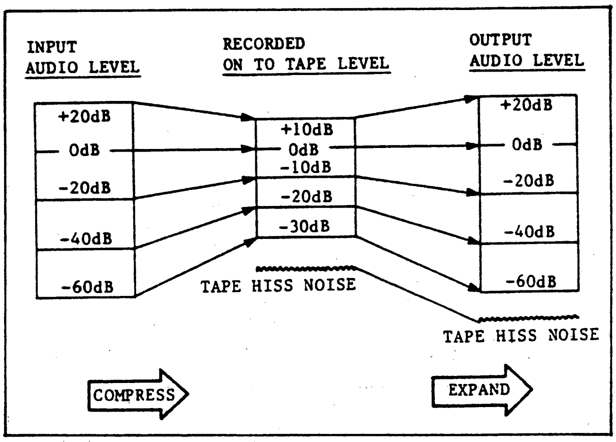


Fig. 11–2 Noise Reduction System

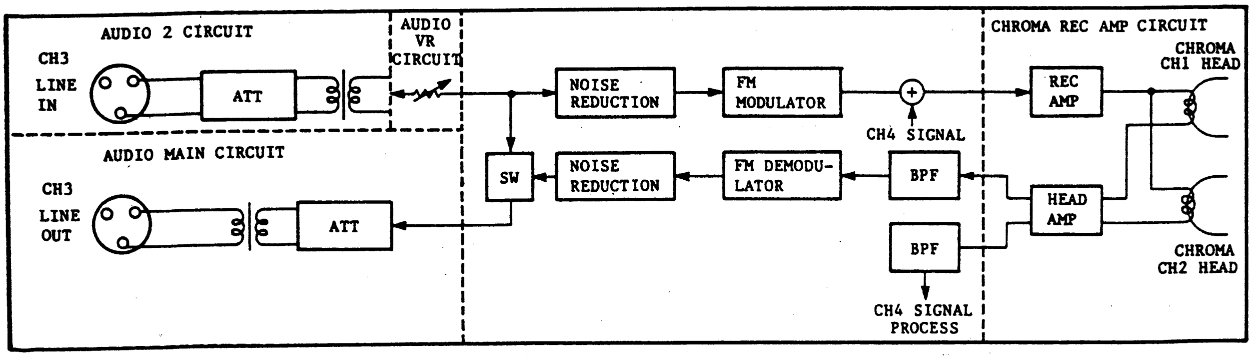


Fig. 11–3 FM Audio Block Diagram of AU–650B for reference of AU–630

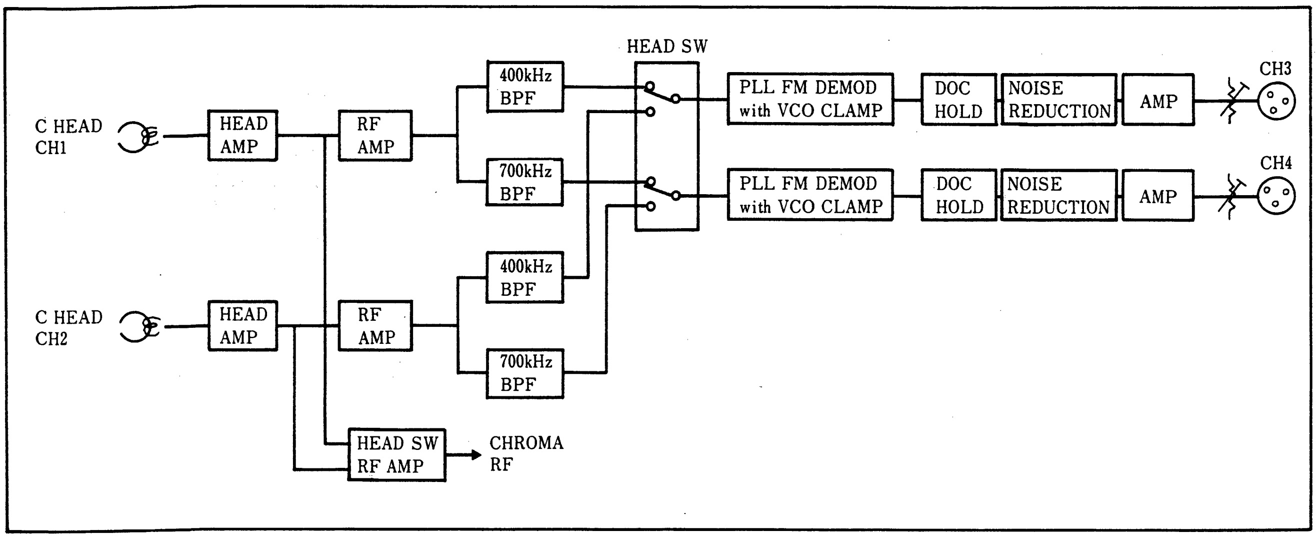


Fig. 11–4 FM Audio Playback Process

11–2. AUDIO PLAYBACK PROCESS

The simplified block diagram for the FM audio playback process is shown in figure 11–4 (channel 3 only).

11–3. BAND PASS FILTER

The chroma outputs of the head amplifier are contained in the CH3 and CH4 signals, so they must be separated by band pass filters (BPF). These BPF's will pass only the channel 3 or channel 4 audio carriers (0.4MHz and 0.7MHz respectively) and reject any chroma information.
Figure 11–5 shows the frequency characteristics of the two band pass filters utilized.

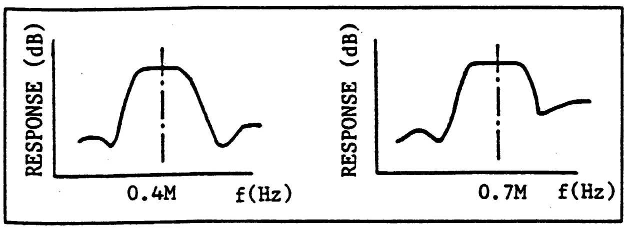


Fig. 11–5 Characteristic of BPF

11–4. FM DEMODULATOR

During playback mode, the FM signal is converted back into its original AM form by an FM demodulator.
This FM demodulation is performed by using the VCO that was used for recording.
A phase comparator compares 2 inputs signals (A and B) and generates an error voltage to drive the VCO directly. When a playback audio signal of a certain FM frequency is presented to the phase comparator, the VCO output frequency is phase locked and the VCO is now operating at the input signal frequency. FM demodulation is performed as directed by the error voltage. This configuration is shown in figure 11–6.

11–5. 100KHz LOW PASS FILTER

The FM demodulated signal is sent to a 100KHz LPF. The demodulated signal is noisy, due to the carrier frequency leakage. This LPF is used to eliminate this carrier leak.

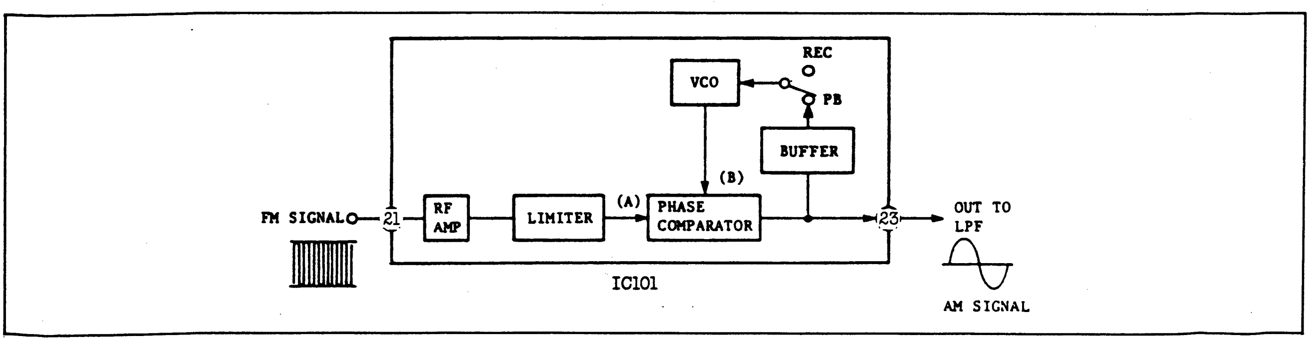


Fig. 11–6 FM De–modulator Circuit

11-6. DROPOUT COMPENSATOR (DOC)

Dropout is a momentary loss of the playback RF signal, generally caused by a dirt on the tape, loose oxide, etc. If such a dropout is not properly compensated for, the signal cannot be fully demodulated. The result of this is that an erratic audio output is produced. To prevent this, a DOC circuit is utilized. The DOC detects attenuated carrier waves, or loss of signal, and holds the FM demodulated audio signal.
The DOC hold circuit not only holds the voltage when a dropout occurs, but also holds the voltage when noise is generated during head switching. This is shown in figure 11-7 and 11-8.

The operation performed during dropout is the same that is performed during head switching. If a dropout longer than a certain fixed interval is produced, a mute (high) signal is output from pin 12 of IC502. The time interval is set by an RC timing circuit. If the dropout exceeds this time interval then Q104 mute the line output. Please refer to figure 11-9.

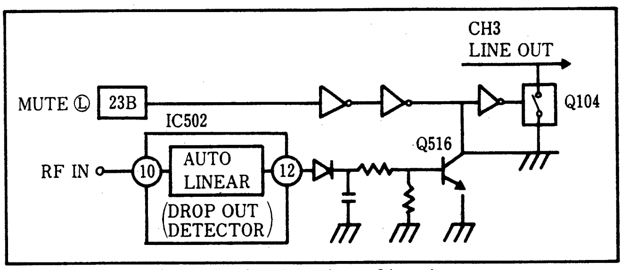


Fig. 11-9 Muting Circuit

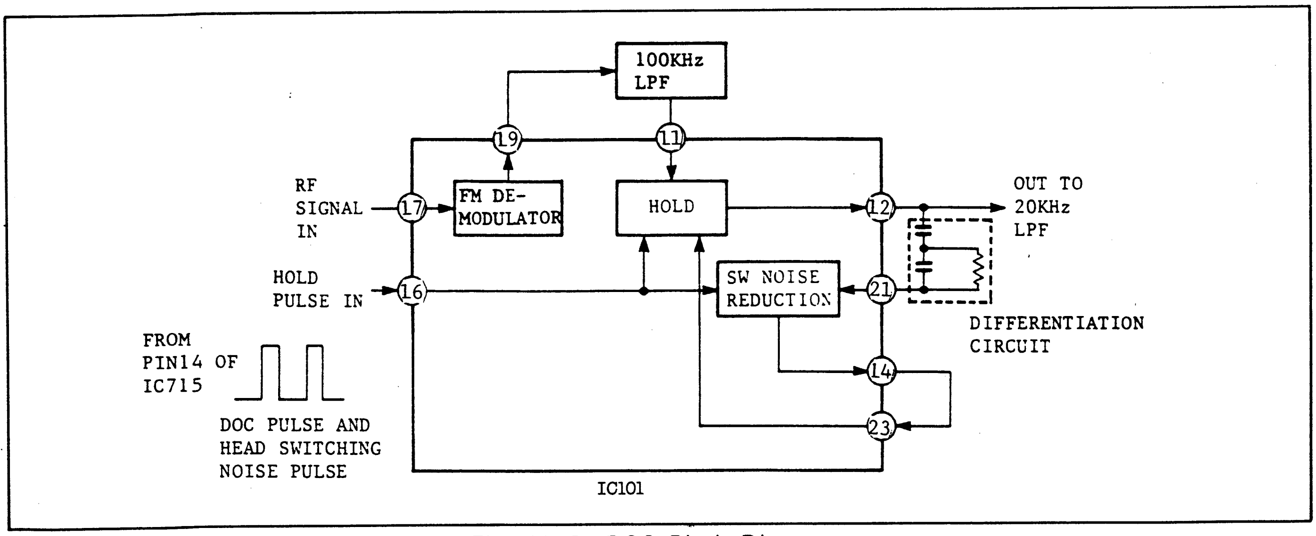


Fig. 11-7 DOC Block Diagram

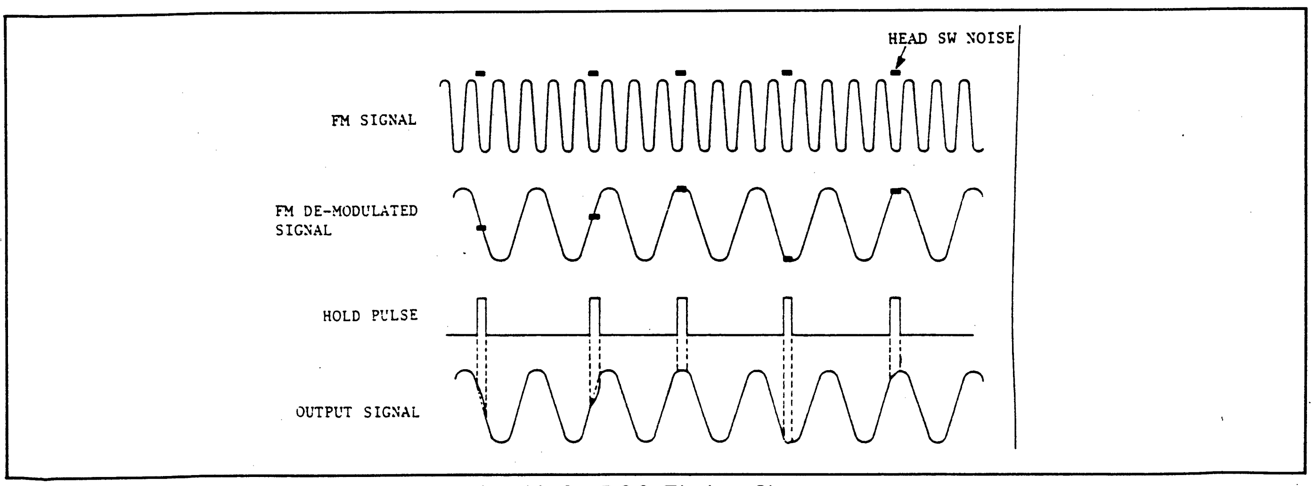


Fig. 11-8 DOC Timing Chart

11-7. 20KHz LOW PASS FILTER

The dropout compensated audio signal is then fed to a 20KHz LPF. The LPF shapes the output as shown in figure 11-10.

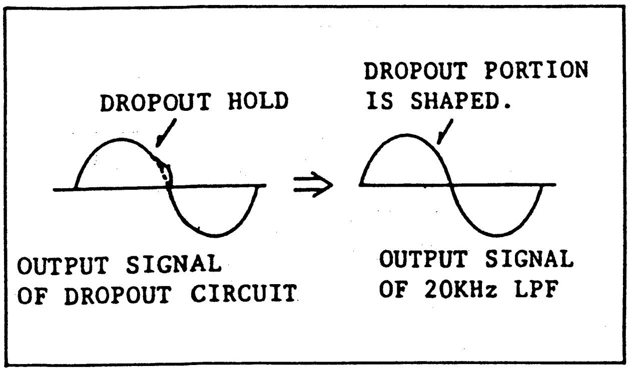


Fig. 11-10 20KHz LPF Waveform

11-8. DE-EMPHASIS 2 CIRCUIT

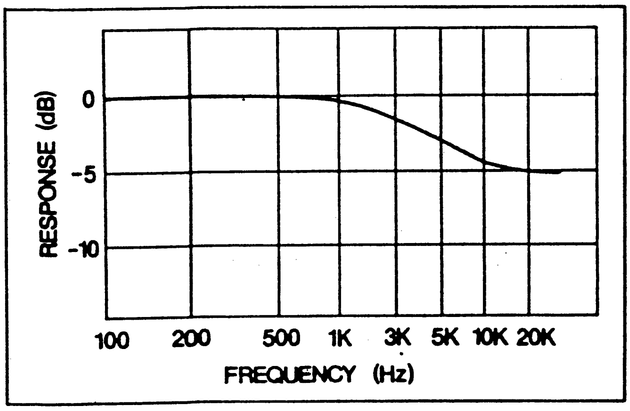


Fig. 11-11 Characteristics of De-emphasis 2

During the recording process, the audio signal was emphasized by the pre-emphasis circuit. In the playback process, the signal must be de-emphasized. In this way, high frequency noise is reduced. Figure 11-11 below, shows the characteristics of the de-emphasis 2 circuit.

11-9. DE-EMPHASIS 1 CIRCUIT

The audio signal de-emhasized by the de-emhasis 2 circuit is de-emhasized again. This is similar in operation to the de-emhasis 2 action that was previously done, and explained. Therefore, it will not be repeated here. The characteristics of this de-emphasis 1 circuit is shown in figure 11-12.

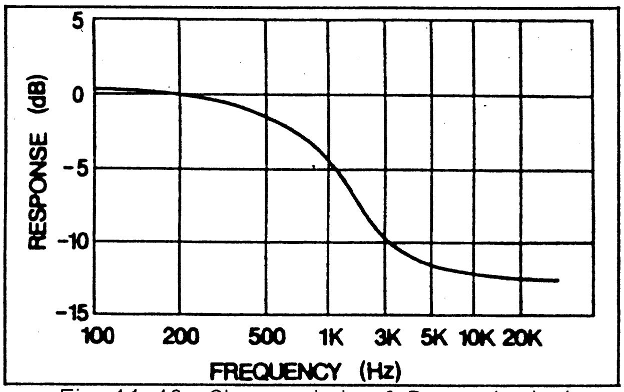


Fig. 11-12 Characteristic of De-emphasis 1

11-10. NOISE REDUCTION (CCA CIRCUIT)

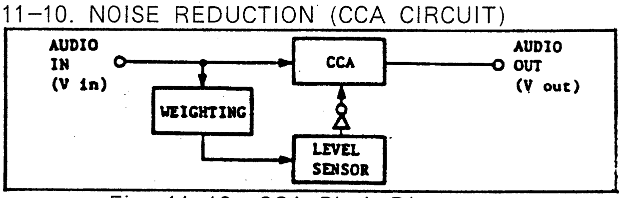


Fig. 11-13 CCA Block Diagram

Please refer to figure 11-13.
During playback, signals are sent to the CCA circuit, and also to the weighting circuit which, in turn, is supplied to the level sensor.
The level sensor detects the peak of the input signal and outputs a current that is proportional to the CCA circuit.
The characteristic of the CCA is opposite to the one that was employed during the recording process. The input signal (Vin) is output as a signal proportional to the level of the input signal, raised to the second power (squared) [logarithmic expansion]. Refer to the diagrams in figure 11-14.

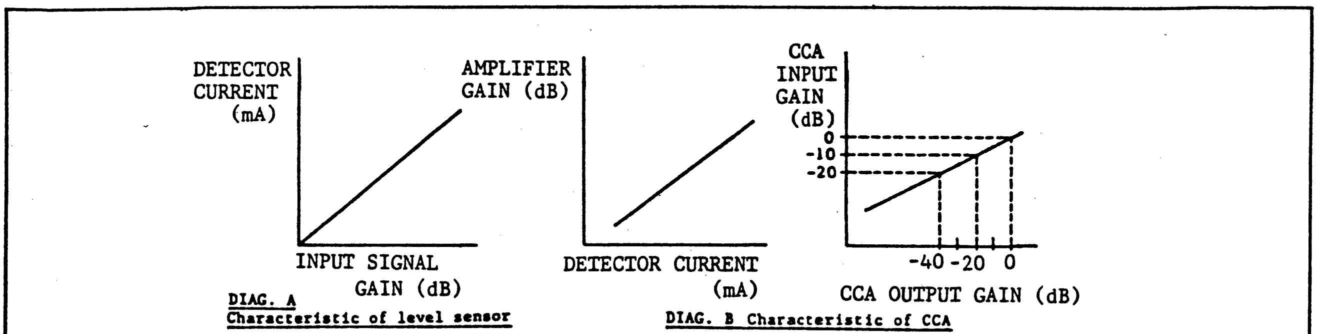


Fig. 11-14 Characteristic of Noise Reduction

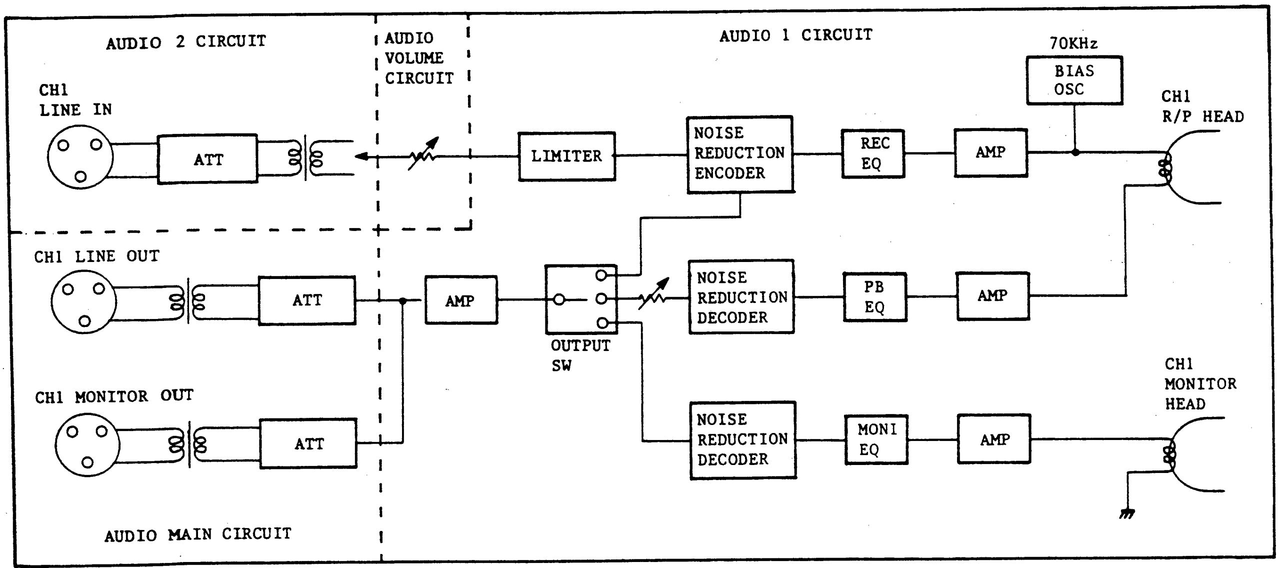


Fig. 12-1 Linear Audio Circuit of AU-650B for referenc of AU-630

12. LINEAR AUDIO (S6)

12-1. PLAYBACK PROCESS

Refer to Figure 12-2.
Signals from the CH1 REC/PB head are amplified approximately 45dB by the initial level amp, and frequency corrections performed by the PB equalizer (IC101). The playback equalizer's response is inverse to that which was used during the recording process. Overall frequency characteristics become linear. For this, refer to figure 12-3.

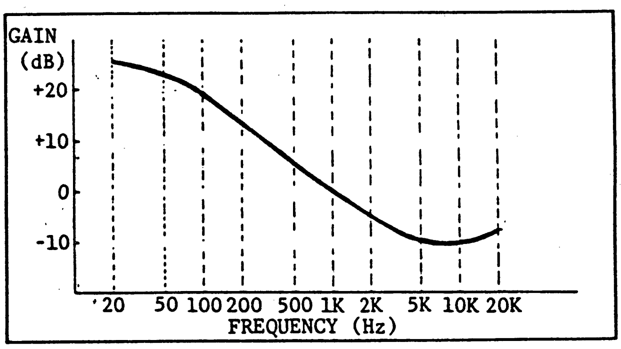
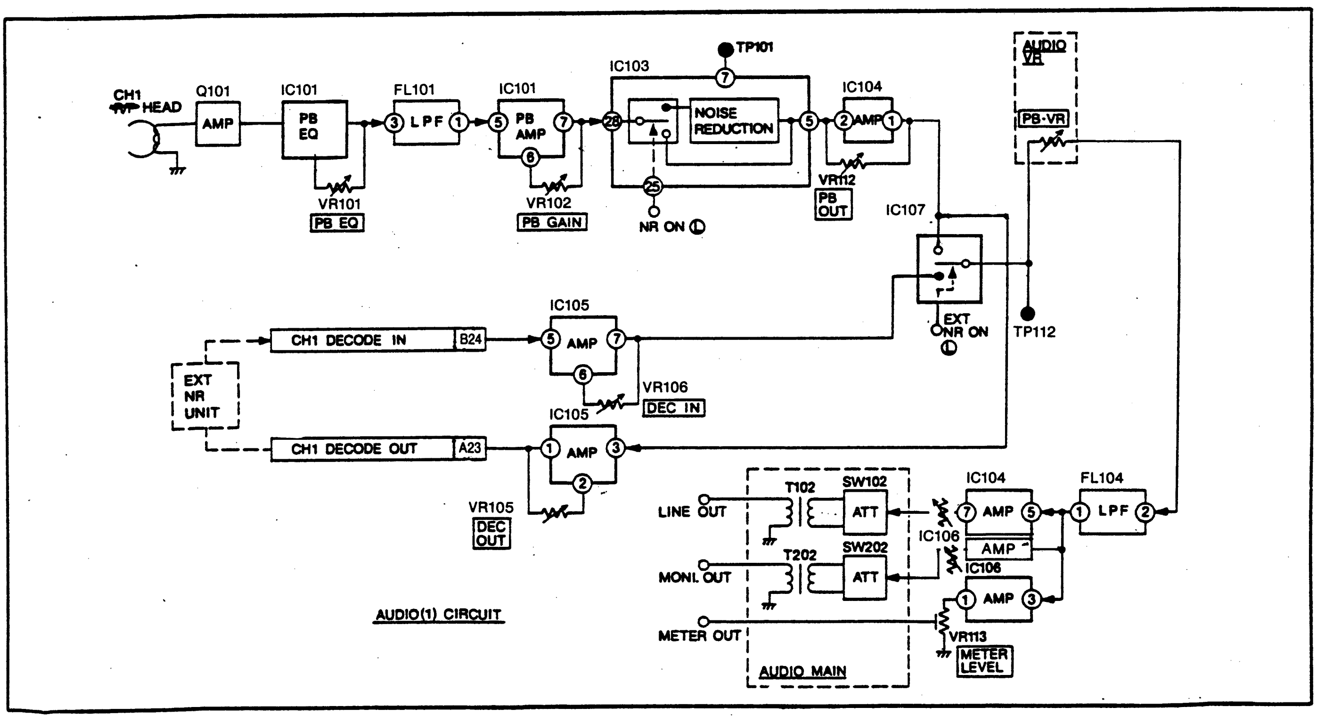


Fig. 12-3 Characteristic of PB Equalizing



A block diagram of the noise reduction circuit is shown below in figure 12–4.

The noise reduction circuit expands signals, compressed during recording back into their original form. The characteristics of this circuit are exactly the inverse of those circuit. This is referred to in figure 12–5.

When low level high–end signals (which are susceptible to tape hiss) are input, the amount of noise reduction is 20dB maximum. signals which have passed through the noise reduction circuit are output, via the line amp.

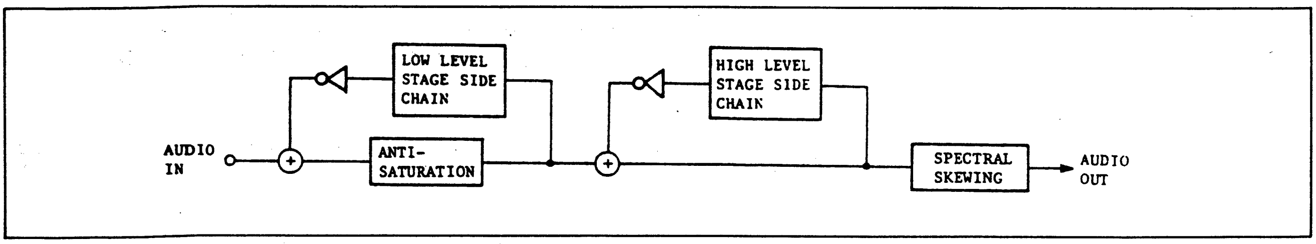
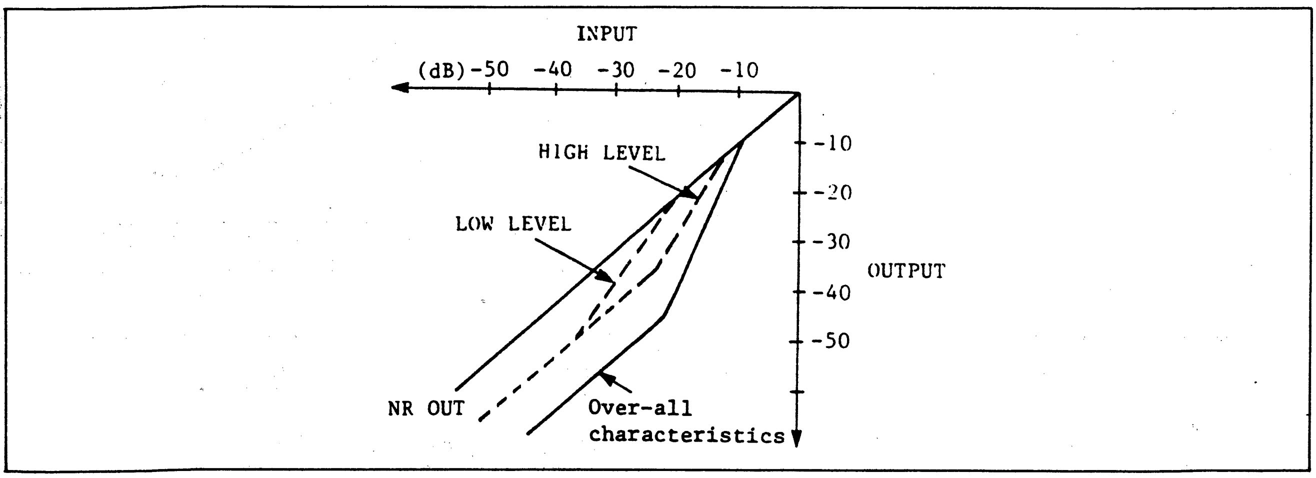


Fig. 12 –4 Noise Reduction Circuit (IC103)



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